TRENDS IN SERVICES PRICING

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ABOUT INPUT

INPUT provides planning information, analysis, and recommendations to companies in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Professional staff have, on average, nearly 20 years experience in the information processing industry. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business probl

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Trends in Services and
Software Pricing
TITLE

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TRENDS IN SERVICES AND SOFTWARE PRICING

IMPACT REPORT #9

JULY 1978

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TRENDS IN SERVICES PRICING

TABLE OF CONTENTS

INPUT

- ii -

INP

TRENDS IN SERVICES PRICING

LIST OF EXHIBITS

INPUT

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I INTRODUCTION

I   INTRODUCTION

- This report is produced by INPUT as part of the Market Analysis Service (MAS). It covers pricing trends for processing services and software products.

- This area of research was selected because of high client interest. It is of value in developing pricing and marketing strategies now and for the 1980s.

- Before the research began, INPUT clients were asked to suggest particular questions and specific areas of interest to be incorporated into the study. A number of the points were added to the questionnaire as a result of client comments.

- Research carried out for this report included a series of interviews carried out in May and June, 1978, and are specified in Appendix A.

- Separate questionnaires were used for vendors and users. Sample questionnaires are in Appendix B. Because of the sensitive nature of vendor pricing information, percentage changes rather than actual price levels were obtained, and the responding vendors are not identified.

- Inquiries and comments on the information presented in this report are invited from clients.

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II EXECUTIVE SUMMARY

II   EXECUTIVE SUMMARY

A.   CURRENT PRICING POLICIES AND CONFLICTS

- Pricing of computer services has traditionally been built up on the basis of costs for labor and hardware plus a judgement concerning the value of the service to the user. The continuing reduction in cost and size of hardware is a major issue in this study of computer services pricing trends.

- According to vendors of both remote computing services (RCS) and software products interviewed for this study, personnel costs are the most important factor in determining prices.

- Profit rather than revenue is gaining in importance as a factor in establishing prices.

- Users, particularly EDP Managers and related functions, perceive the use of in-house hardware as the long-term lower cost solution versus RCS.

    - Users expect the cost of computer services, particularly RCS, to increase.

    - Vendors surveyed, generally, intend to increase prices in 1979-1980 by 5-10%, up to as much as 20%.

- 3 -

INPUT

- Many RCS users interviewed planned to move major portions of these applications in-house; specifically, 51% of EDP managers interviewed planned to move 50% or more of their RCS work in-house by 1980.

● Although the majority of current RCS revenues are not controlled by the EDP manager function interviewed, the magnitude of the EDP manager's predisposition to move RCS revenues in-house is significant because:

- With the continued movement toward distributed processing determined in other INPUT research, the EDP manager has growing influence on all EDP related expenditures.

- Hardware is a larger percent of in-house EDP budgets; thus the impact of lower cost hardware benefits in-house installations to a greater extent.

- Current RCS companies, by allowing users to believe that their prices will increase while hardware prices decline, are particularly vulnerable to replacement by hardware vendors, as hardware vendors capitalize on this belief.

● Software products vendors are not as vulnerable in that users expect their in-house software development costs to increase at least as rapidly as software product prices.

B.   USER ATTITUDES REGARDING SERVICES PRICING

● Although only one-third of RCS users interviewed had experienced price increases in the 1976-1978 period, almost all expected increases in 1978-1980:

- Their expectation was based largely on increased personnel costs and its anticipated impact on services vendors.

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- Further, they expected a continuation of current inflationary trends.

- There was a small amount of movement away from RCS because of past price increases.

● Over 70% of software product users had experienced price increases in the 1976-1978 period:

- Over 90% of the users expected product and/or maintenance price increases by 1980.

- Software products users did not plan to switch to in-house developed alternatives, believing that the software products vendors offered expertise and timely delivery of the product in addition to an often less expensive total cost.

C.   CURRENT PRICING TRENDS FOR PROCESSING SERVICES AND SOFTWARE PRODUCTS

● With two exceptions, vendors of processing services (RCS and batch) planned to increase average prices 5% to 20% between now and 1980 as shown in Exhibit II-1:

- The one respondent who plans to lower prices is being particularly impacted by small, standalone computers.

- The majority of vendors feel that they can increase both prices and profits through the end of the decade.

● With regard to software products companies, all anticipated higher prices between now and 1980 as shown in Exhibit II-2:

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EXHIBIT II-1

RESPONDING RCS VENDORS' PRICE CHANGES FOR
PROCESSING SERVICES FOR 1976-78 AND 1978-80

RESPONDING COMPANIES
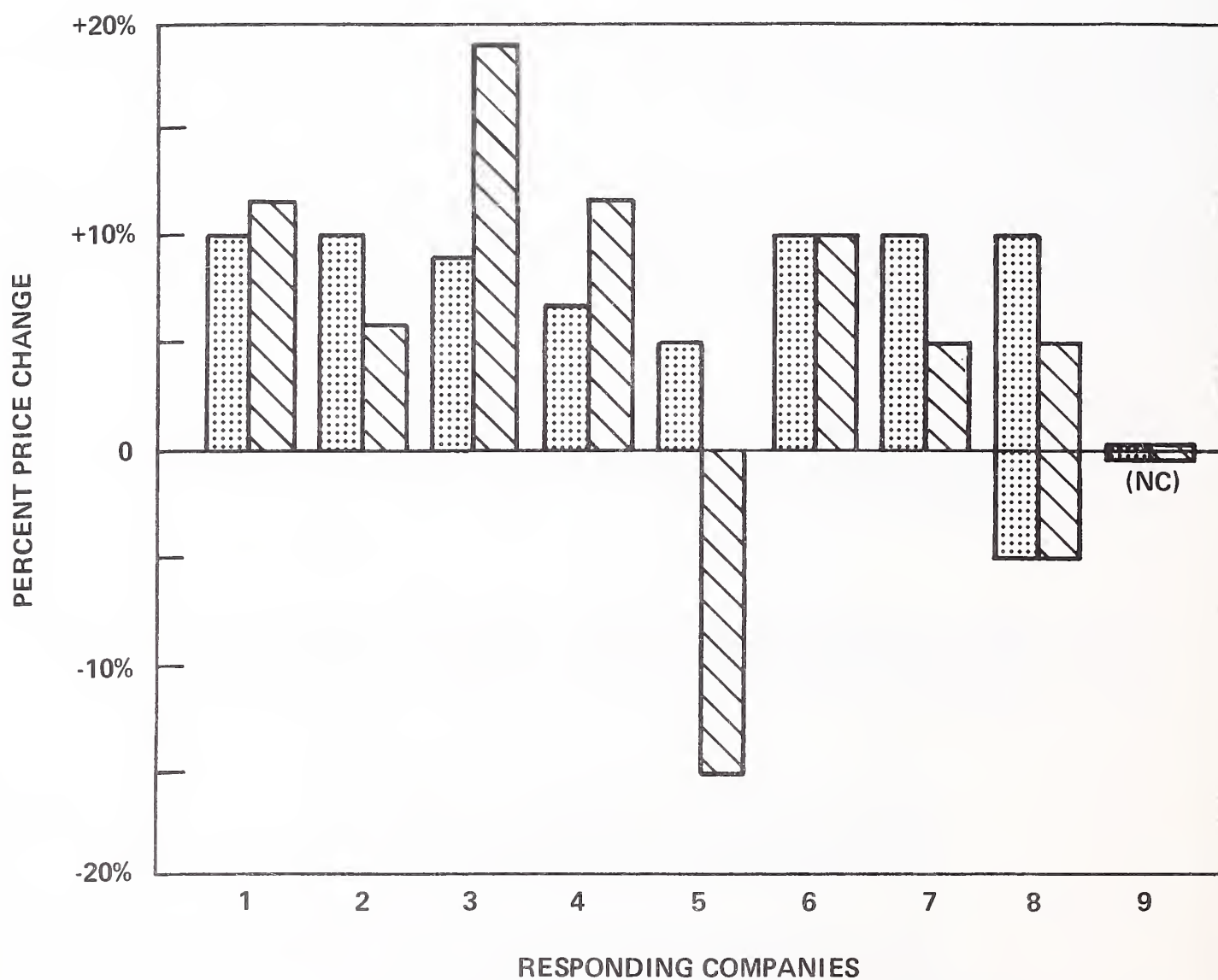
▦ = 1976-1978 ESTIMATED PRICE CHANGES

▧ = 1976-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

- 6 -

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EXHIBIT II-2

RESPONDING SOFTWARE PRODUCTS VENDORS' AVERAGE PRICE CHANGE

BY TYPE OF SOFTWARE PRODUCT FOR 1976-78 AND 1978-80

PERCENT PRICE CHANGE

TYPE OF SOFTWARE PRODUCT

▦ = 1976-78 ESTIMATED PRICE CHANGES

▨ = 1978-80 ANTICIPATED PRICE CHANGES

- 7 -

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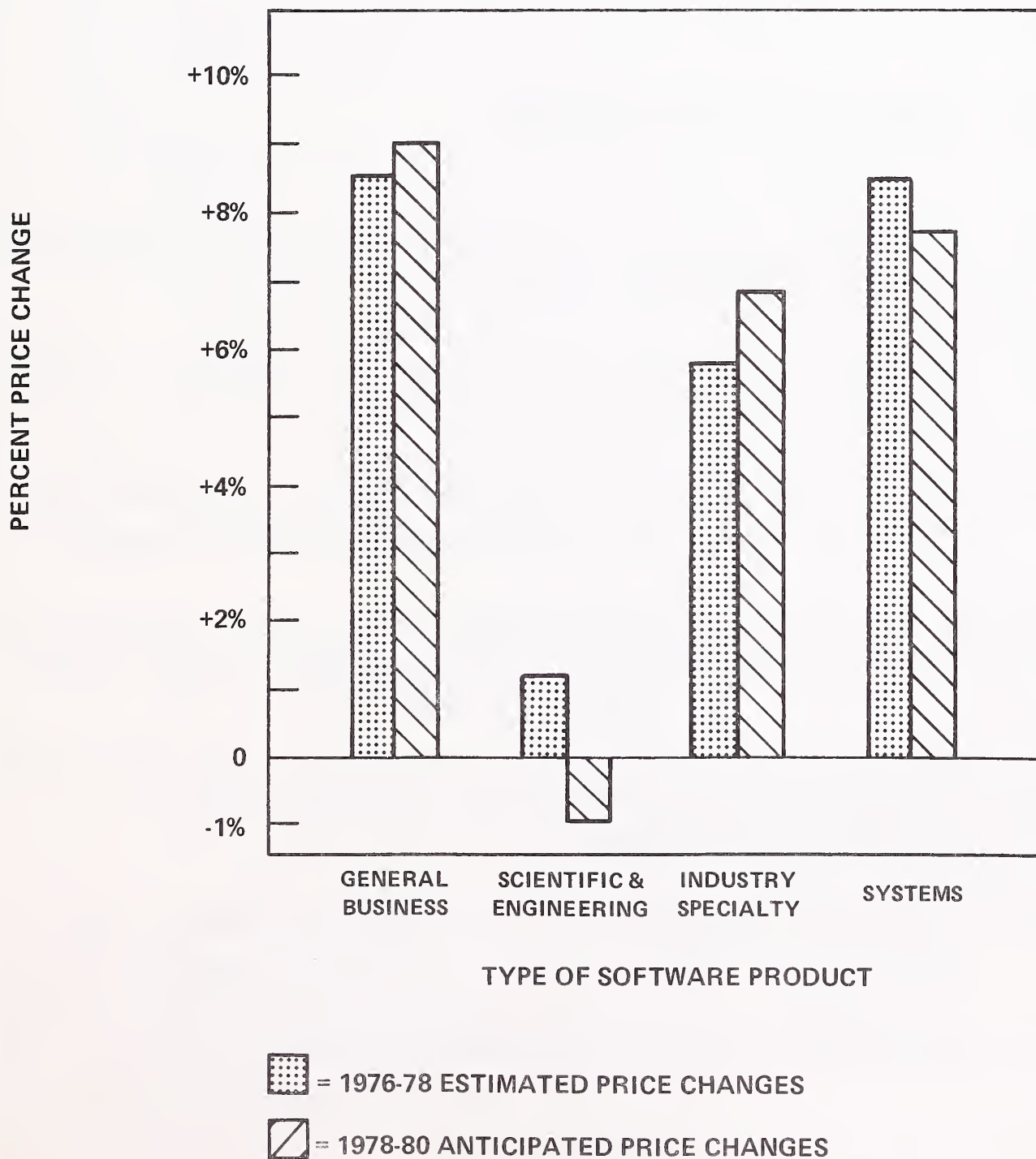
- One product category, scientific and engineering, is expected to decline slightly after a small increase in 1976-1978, reflecting the mature status of the category and the threat of in-house systems.

- The other categories shown on Exhibit II-2, general business, industry specialty, and systems packages all are expected to increase in price by an average of 5-9% between now and 1980, closely paralleling the increase between 1976 and the present.

D.   IMPACT OF USER SITE HARDWARE

- All processing services vendors responding had introduced or were planning to introduce user site hardware offerings.

- User site hardware was expected to increase, contributing up to 20% of revenues by 1980, up from an average of less than 1% currently.

- Self-impact was viewed differently, with respondents estimating a range of - 35% to +20% impact on current RCS revenues from user site hardware.

- Financing plans by vendors for user site hardware included a complete range of alternatives, e.g., purchase, lease, limited partnership, and vendor financed.

- Maintenance plans were divided between leaving the maintenance responsibility with the hardware manufacturer, developing a maintenance force, and using third-party maintenance.

- It is too early to determine the actual success of user site hardware from services vendors. INPUT will perform a MAS study of this subject during the fourth quarter of 1978 when user awareness of current offerings is greater, and the progress of these offerings can be evaluated.

- 8 -

INPUT

E.   RECOMMENDATIONS

I.   PROCESSING SERVICES VENDORS

- To combat the threat from hardware vendors who promote an image of lower future cost, processing services vendors must emphasize their advantages:

  - Processing services often offer lower total cost, if programming, facilities and technical knowledge are considered.

  - In the face of an increasing shortage of technical personnel, processing services often accelerate the implementation of key applications.

  - By packaging user site hardware in their offerings, processing services vendors can present an optimum mix of hardware, people, and expertise.

- Processing services vendors must cultivate EDP management, which is gaining influence due to the emergence of distributed processing and its inherent pressure to centralize EDP expenditures:

  - Vendors can offer services to assist EDP management in developing distributed applications, including use of the RCS vendors network and host computers for program development.

  - Vendors can package current proprietary software for sale or lease to give the user more flexibility in the use of services and in-house facilities. This course must be done selectively to minimize the migration in-house of those current RCS revenues based on proprietary software.

- To capitalize on user's anticipation of price increases for RCS, vendors should selectively increase prices:

- 9 -

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- Services that can be presented as a long-term cost effective alternative because of available vendor software, expertise and/or communications capability are prime candidates for price increases.

- RCS vendors should improve their techniques for announcing price increases. Users interviewed felt software products vendors did a better job of explaining the reasons for price increases.

2. SOFTWARE PRODUCTS VENDORS

- Users interviewed expected software product price increases approximately double the size anticipated by software vendors; vendors should review their pricing plans to insure that their future pricing increases adequately reflect current market opportunities rather than a mere extension of past patterns. Products particularly appropriate for more aggressive pricing include:

  - Complex products such as DBMS and communications software where the user cannot duplicate the required talent in-house.

  - Installed products where the user will be unlikely to reprogram or switch to another software product.

  - Products which will assist the EDP manager in overcoming his growing problem of backlog of uninstalled applications.

- Software products vendors should present their offering more in the context of software "services" to avoid the pricing comparisons which are associated with "product":

  - This is particularly important with systems software where on-going maintenance supports the services image.

  - Therefore, software products presented as services can often support higher price and profit levels.

- 10 -

INPUT

III CURRENT PRICING TRENDS AND METHODS

III   CURRENT PRICING TRENDS AND METHODS

A.   METHODOLOGY OF VENDOR INTERVIEWS

- The vendor sample that was used for this report comprised major RCS and software products vendors. Ten of the 20 leading U.S. RCS vendors shown in Exhibit III-1 were interviewed, as were five of the leading software products companies shown in Exhibit III-2.

    - Since each of the vendors was asked to provide confidential information about pricing practices and plans, there is no identification of the specific firms that participated in the survey. In addition, all pricing changes are dealt with in terms of percentages rather than actual dollar amounts to protect further the confidentiality of the firms.

- The fifteen firms that participated in this survey are very representative of the industry as a whole and are of a size to impact industry trends.

- The purpose of these interviews was to identify:

    - Pricing practices for the past two years.

    - Pricing plans between now and 1980.

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EXHIBIT III-1

TWENTY LEADING U.S. REMOTE COMPUTING
SERVICES COMPANIES

AUTOMATIC DATA PROCESSING

BOEING COMPUTER SERVICES

COMPUSERVE

COMPUTER SCIENCES CORPORATION

COMSHARE

CONTROL DATA CORPORATION

DATA RESOURCES, INC.

GENERAL ELECTRIC
   INFORMATION SERVICES

INTERACTIVE DATA CORPORATION

ITEL

KEYDATA

MCAUTO

NATIONAL CSS

ON-LINE SYSTEMS

OPTIMUM SYSTEMS

RAPIDATA

TYMSHARE

UNITED COMPUTING SYSTEMS

UNIVERSITY COMPUTING COMPANY

XEROX COMPUTER SERVICES

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EXHIBIT III-2

- 13 -

TEN LEADING U.S. SOFTWARE
PRODUCTS COMPANIES

AMERICAN MANAGEMENT SYSTEMS

APPLIED DATA RESEARCH

CINCOM SYSTEMS

COMPUTER ASSOCIATES

INFORMATICS

MANAGEMENT SCIENCE AMERICA

PANASOPHIC

SOFTWARE AG OF NORTH AMERICA

UNIVERSAL SOFTWARE

UNIVERSITY COMPUTING

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- Pricing issues that will significantly affect the economics of the marketplace.

B.   REMOTE COMPUTING SERVICES (RCS) PRICING

I.   RCS VENDOR PRICING METHODS

- Vendors employ three types of pricing. The average for each of the methods used were:

  - Pricing by resources used (CPU seconds, storage, etc.) is the dominant method of invoicing for services provided, with 68.7% of services using this method.

  - Fixed pricing (fixed dollar amount per month) of services accounts for only 7.6% of the pricing methods used by the vendors.

  - Pricing by transaction accounts for 22.4% of pricing. Vendors indicated that they expect to increase this type of pricing method in the future at client request.

  - Some individual RCS vendors use transaction pricing almost exclusively because of the nature of the service they provide. This tends to be very repetitive work such as payroll or invoice processing where the client prefers to be billed in that manner because he can anticipate a known cost per transaction.

2.   RCS VENDOR PRICE CHANGES - 1976-1980

- The trend of RCS prices for the two periods 1976-1978 and 1978-1980 is clearly upward.

- 14 -

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- With few exceptions, vendors increased prices approximately 10% for the period 1976-1978.

- For the period 1979-1980, the expectation regarding pricing is mixed, with vendors planning increases up to 25% in some categories and expecting up to a 20% decline in other categories. On balance, however, the expectation is that there will be further net increases over the next two years.

● The trend of software products prices over the same two periods is more consistent than RCS revenues with the trend also upward.

● Details of pricing trends are described in the following sections for:

- RCS by mode of service - remote computing or batch - and by type of service - general business, scientific and engineering, industry specialty, and utility.

- Software products by type - general business, scientific and engineering, and industry specialty among applications packages, and systems packages (including DBMS).

3. RCS PRICE CHANGES BY MODE OF SERVICE

● RCS, which includes remote batch and interactive services, was increased or held constant by all respondents but one in the 1976-1978 period as shown in Exhibit III-3.

- For the 1978-1980 period, one respondent expected prices to vary by + or -5%, while another planned a 15% decline to counter the impact of on-site minicomputers.

- Other vendors expected further increases in RCS pricing in 1978-1980.

- 15 -

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EXHIBIT III-3

RESPONDING RCS COMPANIES' REMOTE COMPUTING PRICE CHANGES
FOR 1976-1978 AND 1978-1980
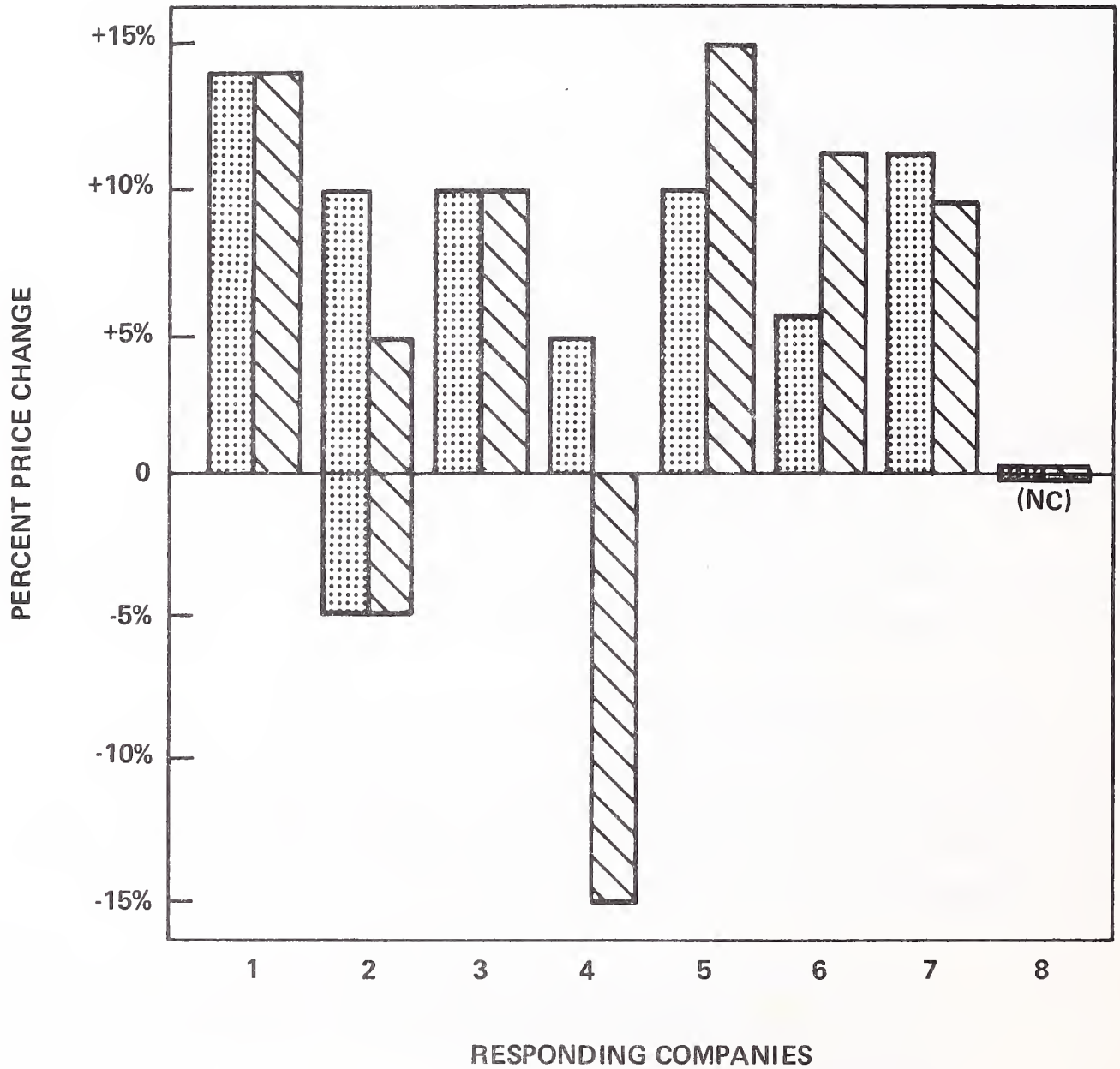
RESPONDING COMPANIES

▦ = 1976-1978 ESTIMATED PRICE CHANGES

▱ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

- 16 -

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- The same two directional trends exist between now and 1980 for mode of service. While there appears to be an average increase in services by about 5%, the variability among the vendors ranged from an increase of 12% to a decrease of 15% based on total services.

- With regard to batch services (see Exhibit III-4), vendors had increased prices in the 1976-1978 period, but three of six respondents expected no net increase in prices in 1978-1980. One vendor was of a different opinion, planning to increase prices by 28%.

4.   RCS PRICE CHANGES BY TYPE OF SERVICE

- All respondents increased general business services prices in 1976-1978 as shown in Exhibit III-5, with the exception of one respondent who made no pricing changes.

  - One respondent planned a significant decline in prices of 20% in 1978-1980 to combat an increasing use of minis by current clients.

  - On balance, only two of nine respondents planned to increase prices at a rate greater than the 1976-1978 increase.

- Scientific and engineering services were increased by 10% by four of six respondents in the 1976-1978 period as shown in Exhibit III-6.

  - This reflects a tendency for these prices to move in parallel between vendors.

  - With regard to plans for 1978-1980, respondents expect to increase prices, but no two respondents plan the same increase as shown in Exhibit III-6.

- Industry specialty services, shown by other INPUT research to be growing most rapidly, shows remarkably uniform price behavior for the 1976-1978 period:

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EXHIBIT III-4

RESPONDING RCS COMPANIES' BATCH PRICE CHANGES
FOR 1976-1978 AND 1978-1980
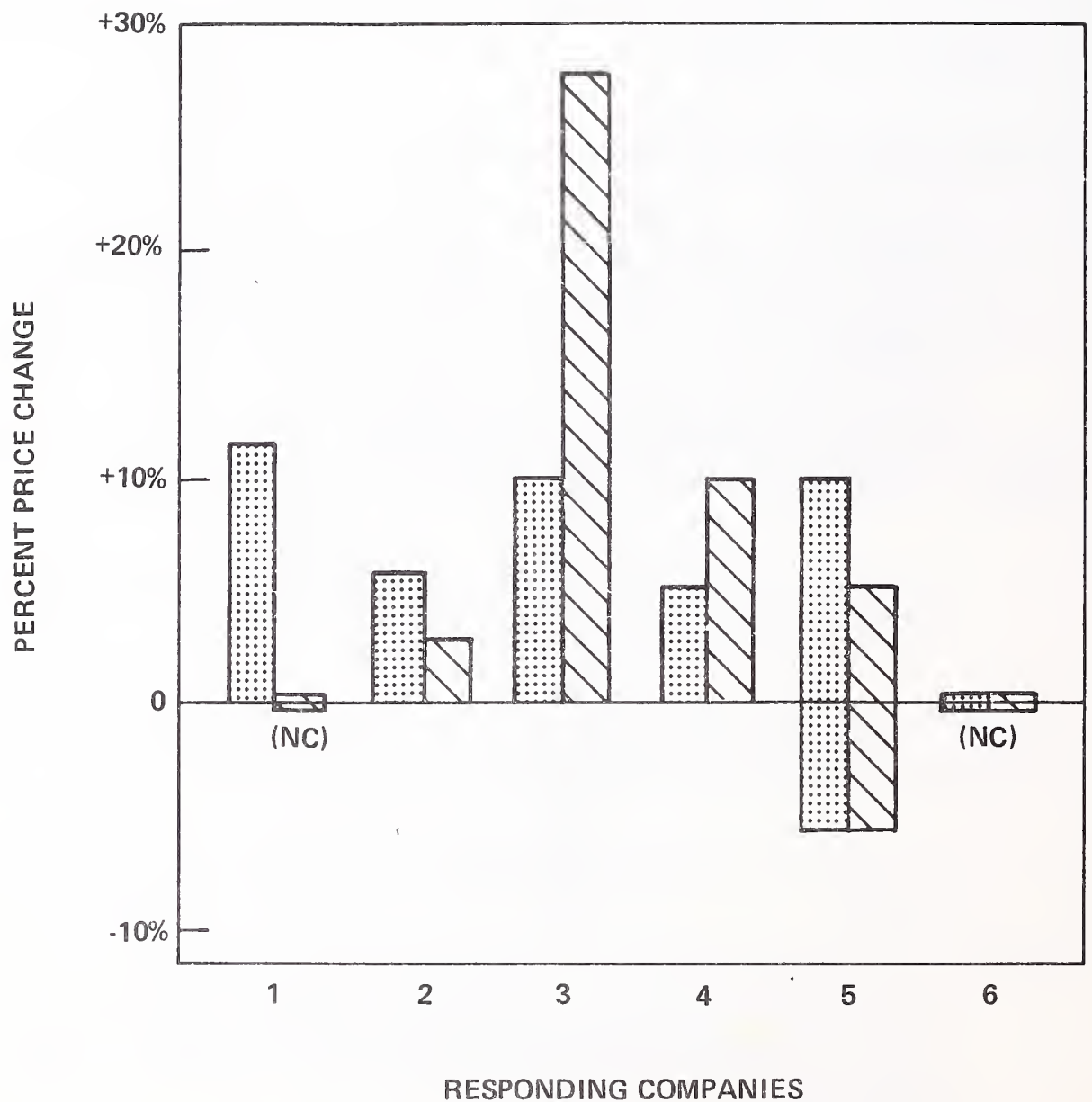
RESPONDING COMPANIES

▦ = 1976-1978 ESTIMATED PRICE CHANGES

◫ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

- 18 -

EXHIBIT III-5

RESPONDING RCS COMPANIES' PRICE CHANGES

FOR GENERAL BUSINESS SERVICES IN 1976-1978 AND 1978-1980

RESPONDING COMPANIES

▦ = 1976-1978 ESTIMATED PRICE CHANGES

◫ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

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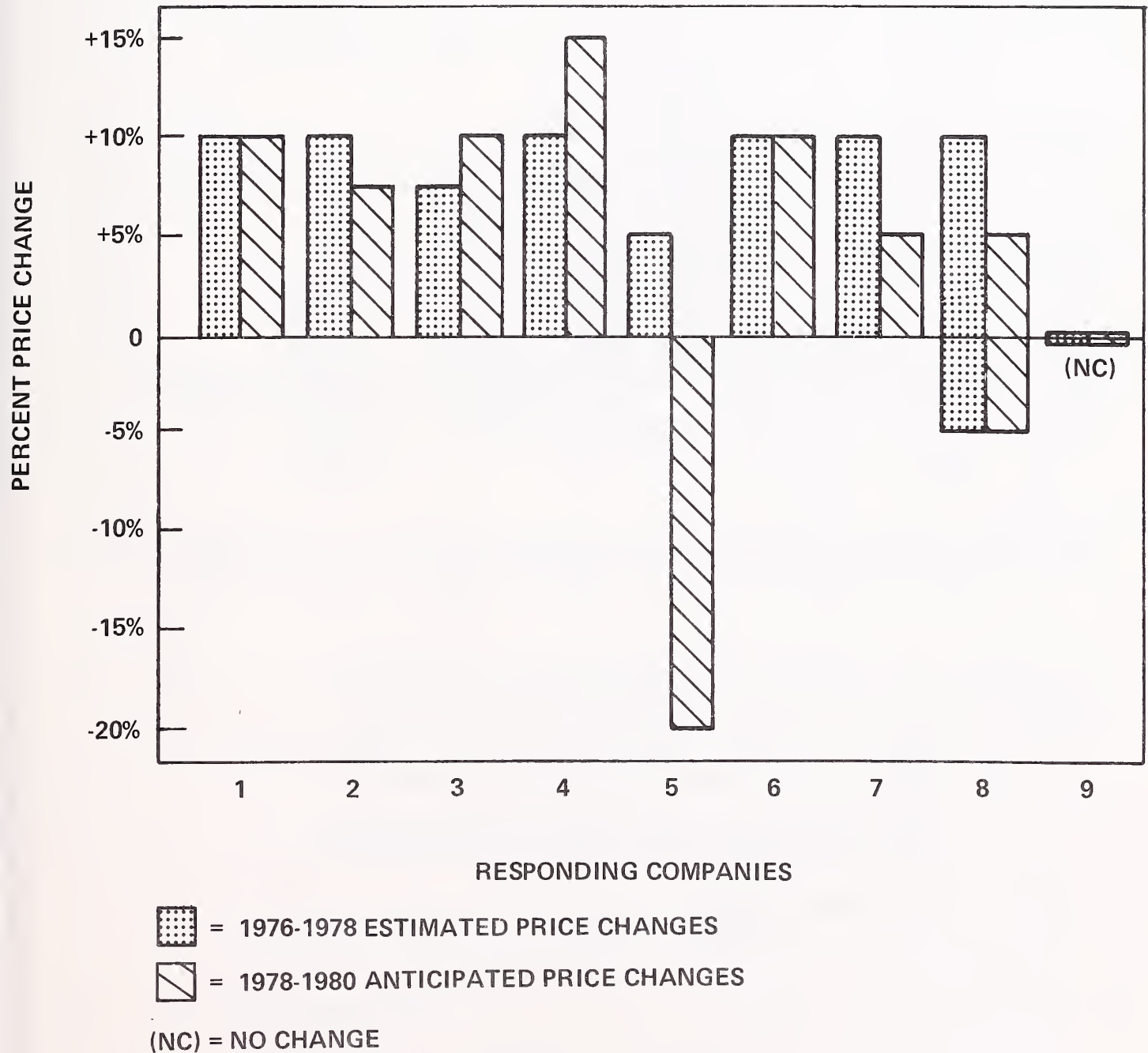
EXHIBIT III-6

RESPONDING RCS COMPANIES' PRICE CHANGES

FOR SCIENTIFIC & ENGINEERING SERVICES IN 1976-1978 AND 1978-1980

RESPONDING COMPANIES
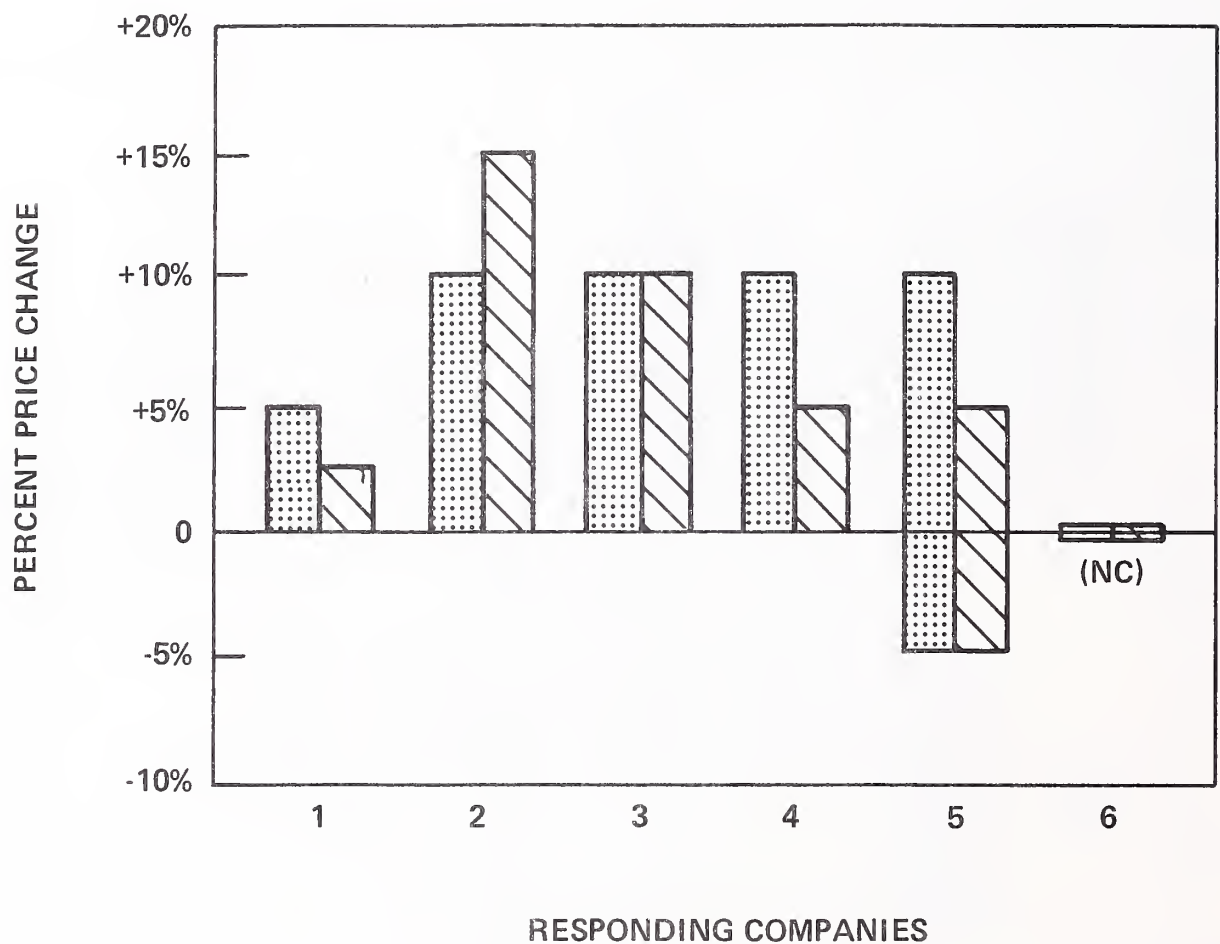
▦ = 1976-1978 ESTIMATED PRICE CHANGES

◨ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

- As shown in Exhibit III-7, six of eight respondents had a 10% price increase.

- This uniformity is in spite of the widely differing nature of services in this category, from demand deposit accounting services to patient monitoring services, etc.

- There is some reflection of the diversity in these services in the anticipated changes for the 1979-1980 period, from a decline of 10% to an increase of 15%.

- Utility services show a profile almost identical to scientific and engineering services as can be seen by comparing Exhibit III-8 with Exhibit III-7:

    - The similarity reflects the relative maturity of many services in both categories.

    - Vendors in both categories intend to implement price changes in the 1979-1980 period similar to those implemented in the 1976-1978 period.

C. CONTRIBUTION OF PRICE INCREASE TO RCS SALES VOLUME - 1976-1978

- Respondents estimated the amount that price increases had contributed to sales volume during the past two years and estimated its contribution to future sales. Results are presented in Exhibit III-9.

    - The average contribution to sales volume was 6.5%.

    - The range of contribution was from 2-15%.

- During the same period:

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EXHIBIT III-7

RESPONDING RCS COMPANIES' PRICE CHANGES
FOR INDUSTRY SPECIALTY SERVICES IN 1976-1978 AND 1978-1980
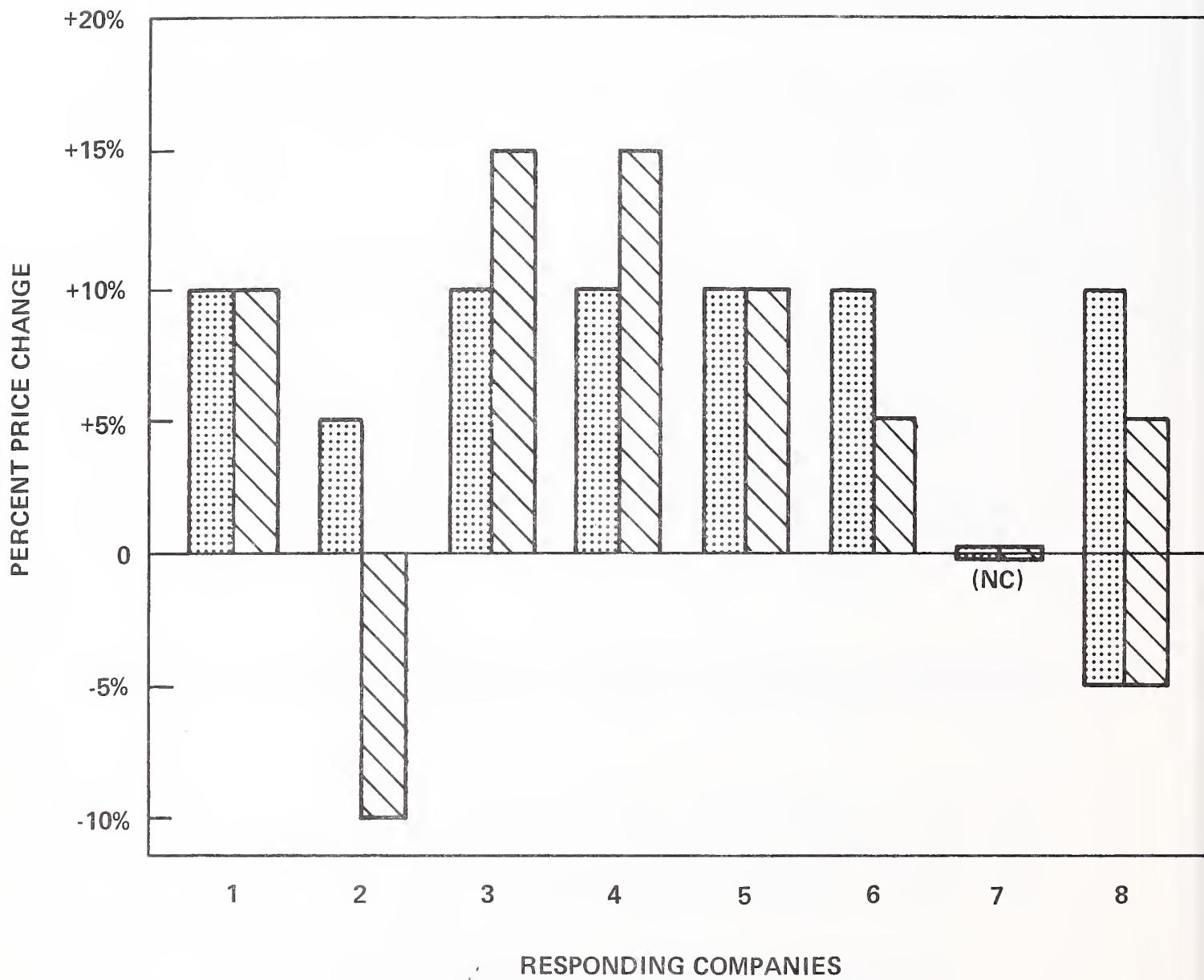
RESPONDING COMPANIES

▦ = 1976-1978 ESTIMATED PRICE CHANGES

◹ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

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EXHIBIT III-8

RESPONDING RCS COMPANIES' PRICE CHANGES
FOR UTILITIES SERVICES IN 1976-1978 AND 1978-1980
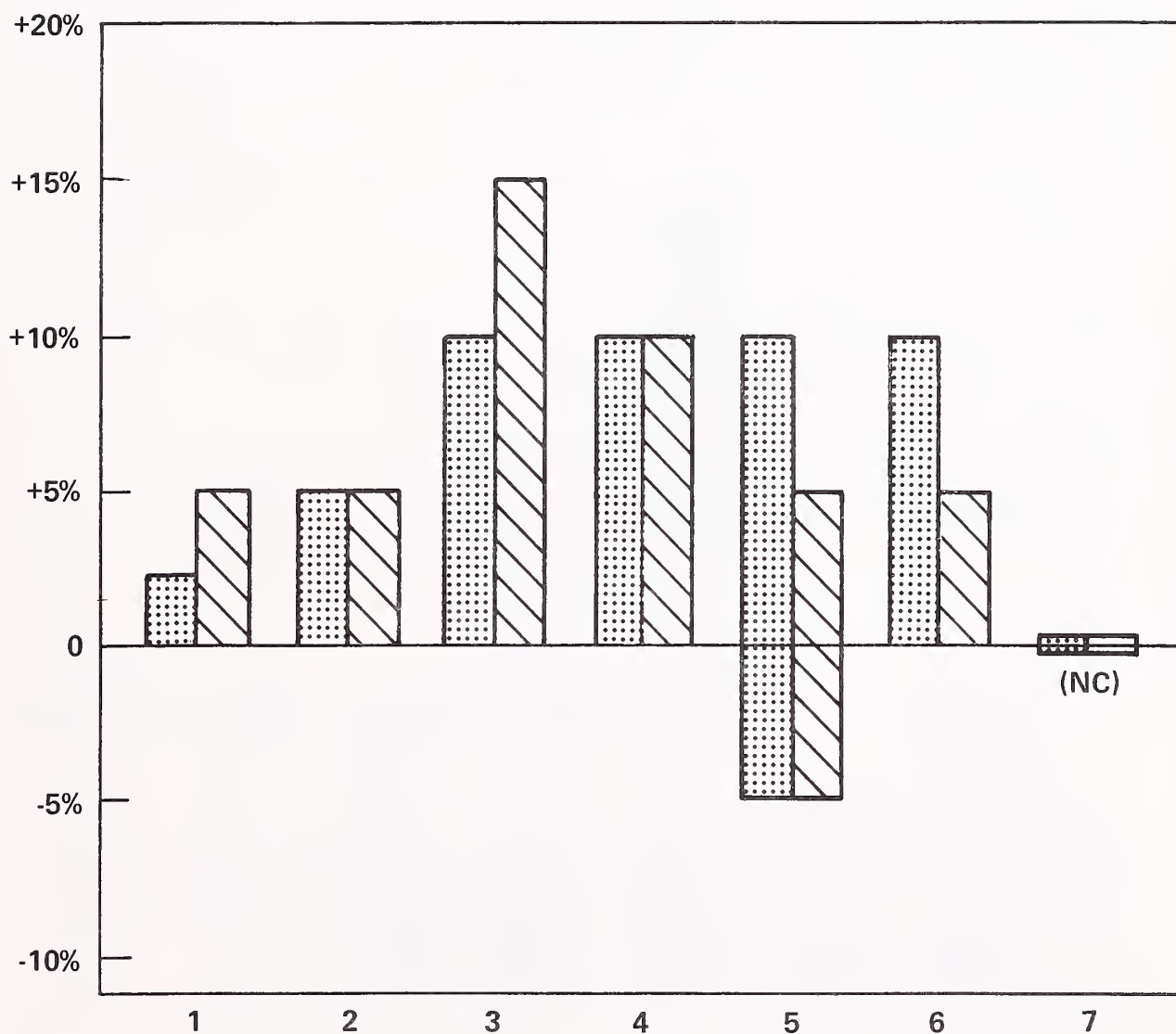
RESPONDING COMPANIES

▦ = 1976-1978 ESTIMATED PRICE CHANGES

◹ = 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

- 23 -

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EXHIBIT III-9

CONTRIBUTION OF PRICE INCREASE
TO SALES INCREASE FOR RCS COMPANIES
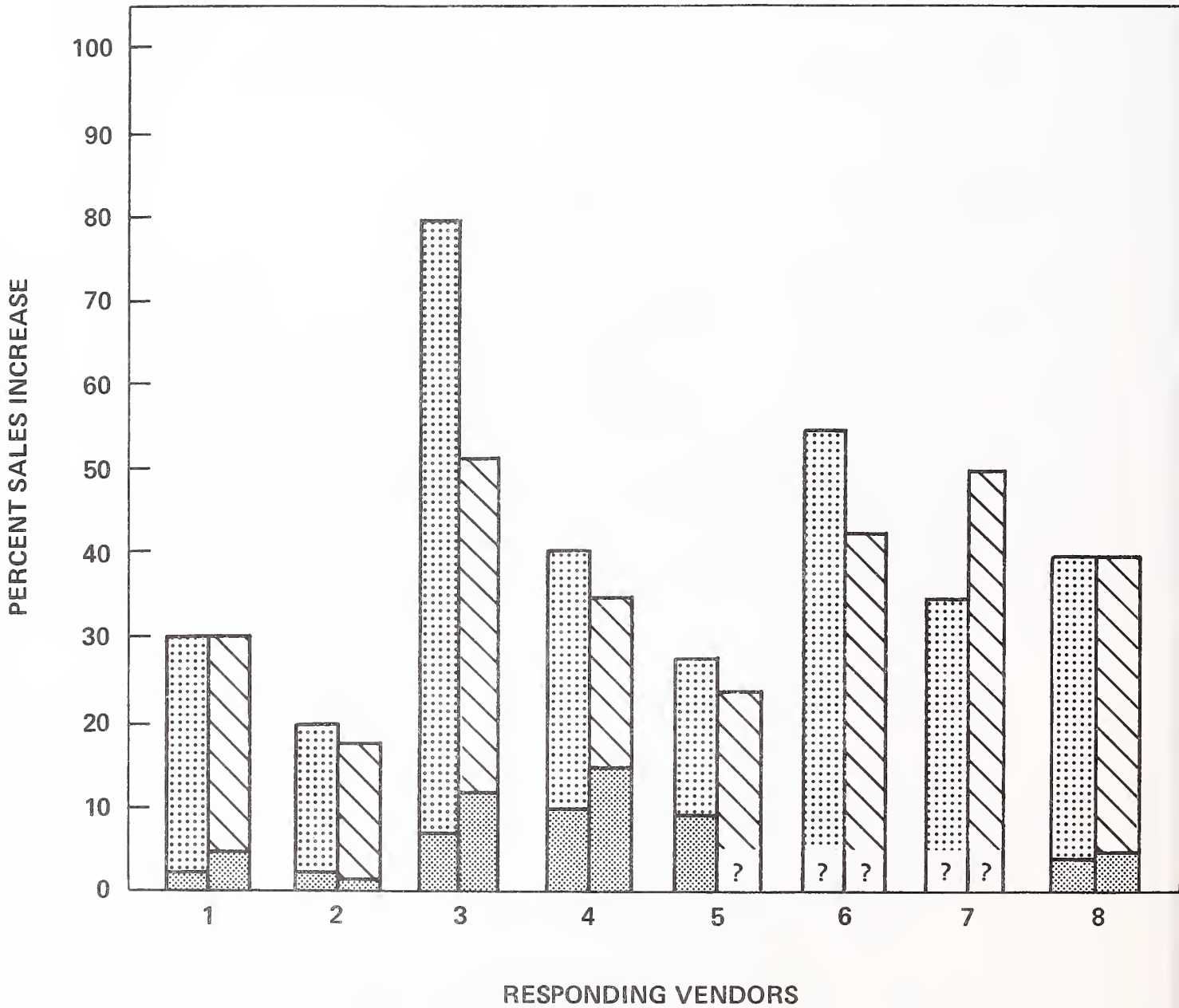
= 1976-1978 SALES INCREASE

= 1978-1980 SALES INCREASE

= PRICE INCREASE CONTRIBUTION

? = PRICE INCREASE CONTRIBUTION NOT DEFINED BY RESPONDENT

INP

- The average sales volume increase was 39%.

- The range of sales volume increase was from 15-70%.

- Clearly, price increases are a contributor to revenue growth, but not a dominant one.

● A similar pattern emerges from the respondents expectation of the contribution of future price increases to sales volume:

- Vendors expect their sales volume to increase an average of 36% by 1980 with price increases as a 4.9% contributor.

- The range of sales volume increase by 1980 is expected to be from 18-50%, with price providing a range of contribution from 1.5-15%.

- Four of the vendors expected price increases to be a larger contributor to sales volume than they had experienced in the last two years. This increased contribution ranged from 1-5%.

D. RCS BUSINESS LOST BECAUSE OF PRICE INCREASES

● Price increases did not significantly contribute to the amount of lost business the responding RCS vendors had experienced.

● Only three of the vendors interviewed indicated that they had lost any business as a direct result of price increases.

● The migration of this business to other sources was as follows:

- One RCS vendor lost less than 1% of one scientific and engineering account to a hardware (mini) vendor that was installed in-house.

- 25 -

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EXHIBIT III-10

RATING OF IMPORTANCE OF PRICING FACTORS BY RESPONDING RCS COMPANIES

PRICING POLICY FACTOR	AVERAGE SCORE	PERCENT VENDOR SELECTED AS MOST IMPORTANT
COMPETITION-OTHER RCS VENDORS	4.0	36%
COMPETITION-IN-HOUSE	3.4	9%
COMPETITION-HARDWARE VENDORS	3.3	27%
ECONOMIC CONDITIONS	3.4	36%
FEDERAL GOVERNMENT ACTIONS	2.4	9%

(5 = HIGH, 0 = LOW)

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- One RCS vendor lost less than 5% of his general business accounts to another RCS vendor.

- One RCS vendor had about 5% of his accounts discontinued by the users.

● In conclusion, the amount of price increase that RCS vendors have introduced into the marketplace over the past two years has not had a major detrimental effect on lost accounts.

E.   EVALUATION OF RCS PRICING FACTORS

● Since price increases did not have a significant detrimental effect on existing business, other factors must be considered in determining pricing policy. To determine the relative importance of various factors on pricing policy, RCS vendors were asked to rate a number of different factors (5=high, 1=low). Exhibit III-10 summarizes their rating of these factors.

- Competition from other RCS vendors is the primary factor in pricing decisions, with a score of 4 and 36% of the first place ratings. (It should be noted that respondents were allowed to rate more than one factor as high if they believed them to be of equal significance.)

- In-house competition was seldom seem as the most important factor but was considered a contributing factor in almost all cases.

- Government actions are of little concern to the respondents, with a score of only 2.9% and 9% of the first place ratings.

- 27 -

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- These findings are consistent with other INPUT research in that the RCS vendor views his competition as dispersed among other RCS vendors, hardware vendors, and in-house, with the main issue being his own ability to bring a solution to the client.

F. IN-HOUSE COMPETITION FACTORS - RCS VENDORS

- In order to better understand how RCS vendors perceive competition from in-house as a threat to their market share, they were asked to rate a number of factors on a scale of 5 (high) to 1 (low). Exhibit III-11 provides a summary of these ratings in terms of both average score and number of first place mentions. Results are:

  - Cheaper hardware for in-house use is perceived by the RCS vendors as the highest competitive factor.

  - This is followed closely by better software from hardware vendors.

  - Distributed data processing and cheaper communications are rated very low by the vendors.

- Of additional importance are the low ratings that were received for in-house sophistication and in-house developed software.

- Clearly, RCS vendors perceive the loss of business to in-house sources as largely resulting from actions taken by hardware vendors in terms of better, cheaper products, rather than from increased in-house capability.

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EXHIBIT III-11

RATING OF IMPORTANCE OF IN-HOUSE COMPETITION
FACTORS BY RESPONDING RCS COMPANIES

COMPETITION FACTOR	AVERAGE SCORE	PERCENT VENDOR SELECTED AS MOST IMPORTANT
CHEAPER HARDWARE	4.0	36%
BETTER SOFTWARE FROM HARDWARE VENDOR	3.7	18%
DISTRIBUTED DATA PROCESSING	2.9	0%
GREATER IN-HOUSE SOPHISTICATION	2.6	9%
CHEAPER COMMUNICATIONS	2.6	0%
BETTER IN-HOUSE DEVELOPED SOFTWARE	2.2	9%
SECURITY	1.3	0%

(5 = HIGH, 0 = LOW)

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G.   RCS VENDOR DISCOUNTING AND BILLING PRACTICES

- Vendors were asked to provide information on the various types of discounts they provided to clients. The result of this question is presented in Exhibit III-12.

- There is good consistency across the industry in terms of types of discounts offered:

  - All of the vendors surveyed provided long-term discounts which varied from 5-40% with a mean of 17%. No significant change (over current levels) was anticipated in long-term discounts between now and 1980.

  - All but 10% provided volume discounts, which ranged up to 40% for very high volumes. A slight increase in this type of discount is expected between now and 1980.

  - The highest level of discounting was offered to government organizations with an average of 34% and a range from 10% to 40%. No increases in these types of discounts can be expected between now and 1980.

  - Educational institutions are not currently receiving any discounts and none are expected to be introduced between now and 1980.

- As an allied issue to discounting practices, RCS vendors were queried about any billing problems they had experienced with their clients:

  - Fifty percent of the vendors indicated they had experienced some problems with their invoices.

  - The primary area of difficulty dealt with interpretation and explanation of the billing units to users.

- 30 -

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EXHIBIT III-12

PRICE DISCOUNTS PROVIDED BY RESPONDING RCS COMPANIES
FOR 1976-78 AND 1978-80

PERCENT DISCOUNT

▦ = 1976-1978

◪ = 1978-1980

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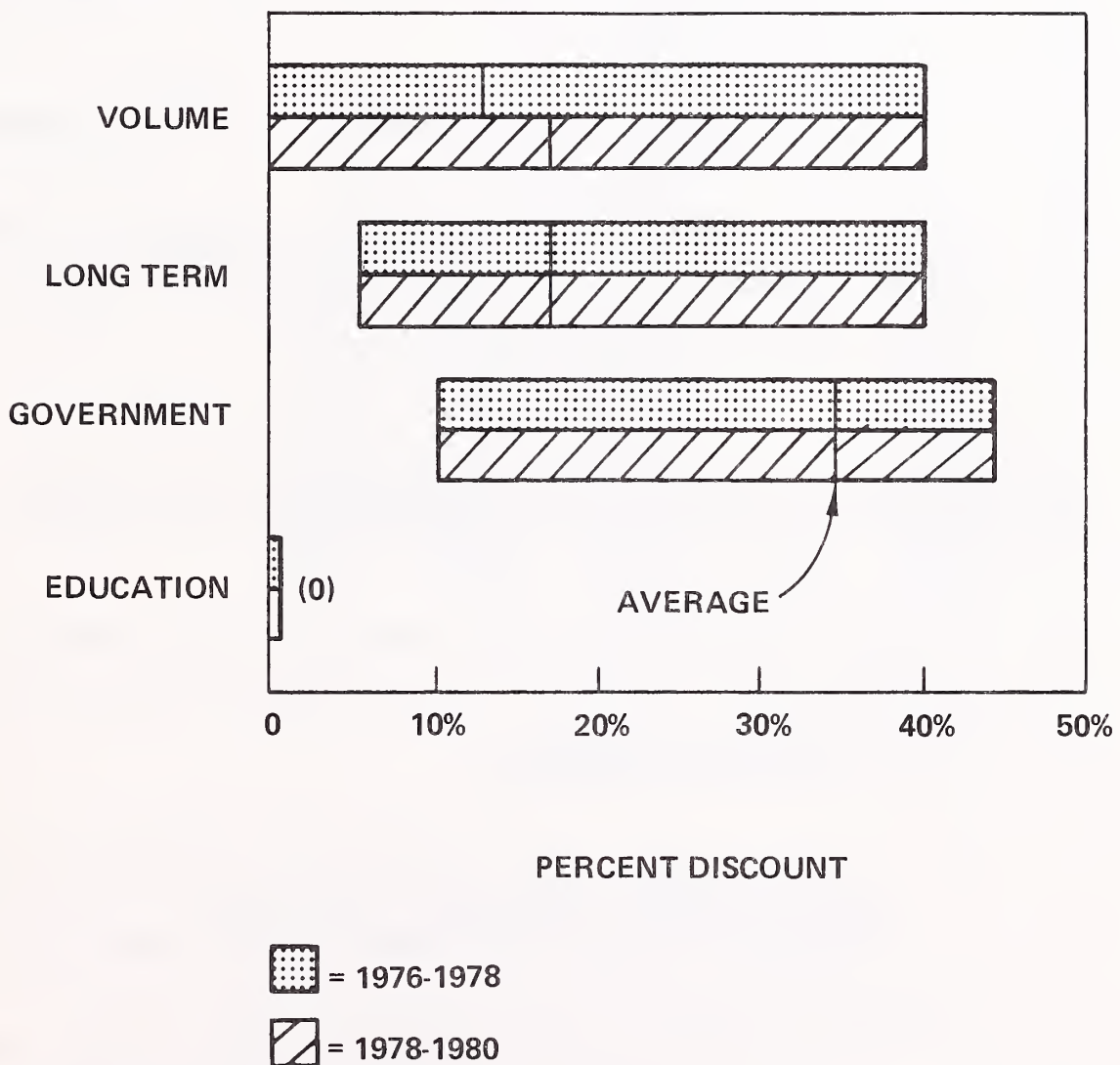
- As a result of these invoicing problems, vendors indicated that they had gone to a restructuring of their billing techniques.

- The 50% who were making billing changes varied considerably in their solutions.

  - One of the vendors had simply reformatted the information on the actual invoices to make it clearer to the client.

  - Two vendors had combined some of their smaller billing units with larger billing units.

  - Two vendors had developed a completely new billing algorithm.

  - One vendor was in the process of developing a completely new functional billing system that was a departure from a resource used system to a transaction basis.

H.   SOFTWARE PRODUCT PRICE CHANGES - TYPE OF PRODUCT

- Vendors of software products gave differing responses according to the type of software product discussed - general business, scientific and engineering, industry specialty, or systems.

  - General business software products were increased an average of 8.6% from 1976-1978. Of the five respondents, two were very optimistic regarding increases in 1979-1980 as shown in Exhibit III-13.

  - Scientific and engineering products showed the lowest average increase between 1976-1978 of only 1.3%. More significant is the wide difference between the three respondents regarding pricing changes in 1979-1980 as shown in Exhibit III-14.

- 32 -

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EXHIBIT III-13

RESPONDING SOFTWARE PRODUCTS COMPANIES' PRICE CHANGES FOR
GENERAL BUSINESS PRODUCTS IN 1976-78 AND 1978-80
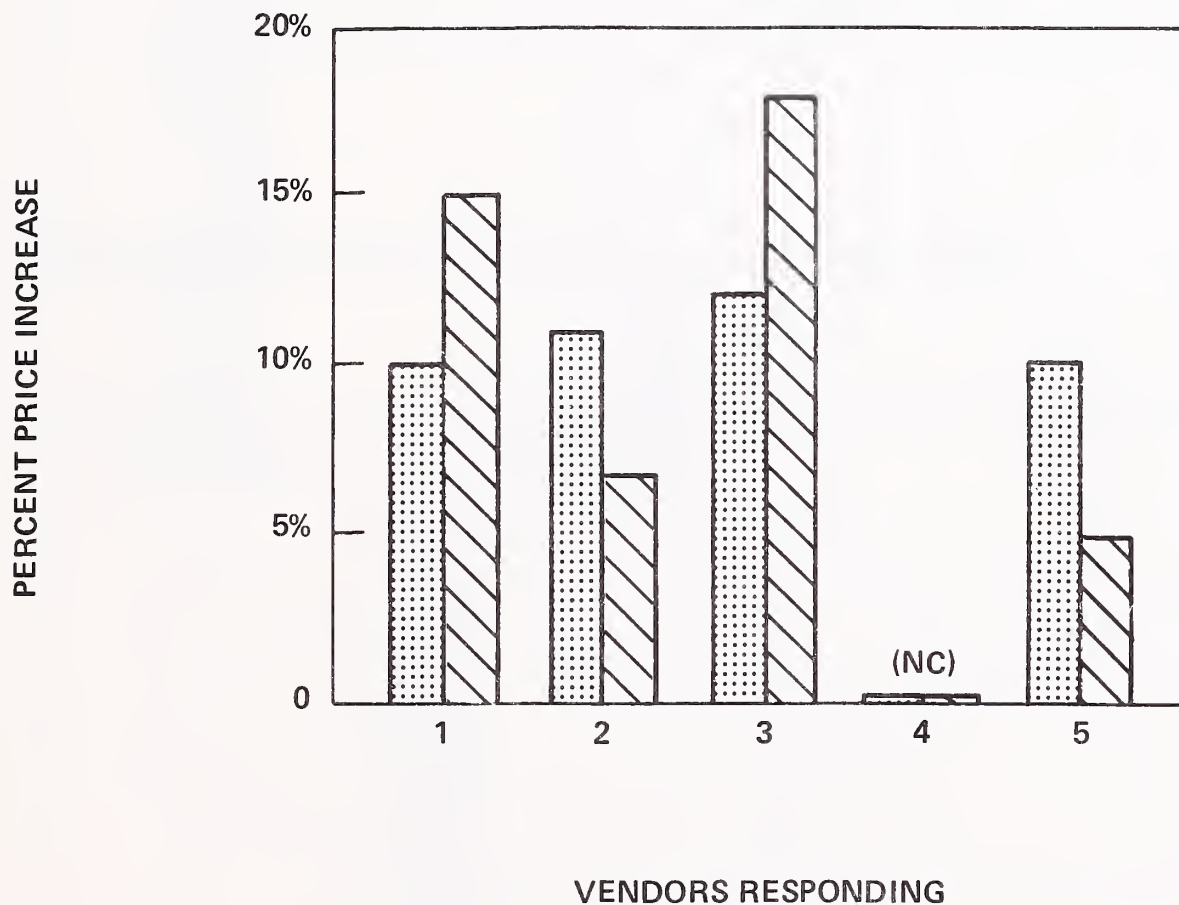
= 1976-1978 ESTIMATED PRICE CHANGES

= 1978-1980 ANTICIPATED PRICE CHANGES

(NC) = NO CHANGE

INPUT

EXHIBIT III-14

RESPONDING SOFTWARE PRODUCTS COMPANIES' PRICE CHANGES

FOR SCIENTIFIC & ENGINEERING PRODUCTS IN 1976-78 AND 1978-80

VENDORS RESPONDING

= 1976-1978 ESTIMATED PRICE CHANGES

= 1978-1980 ANTICIPATED PRICE CHANGES

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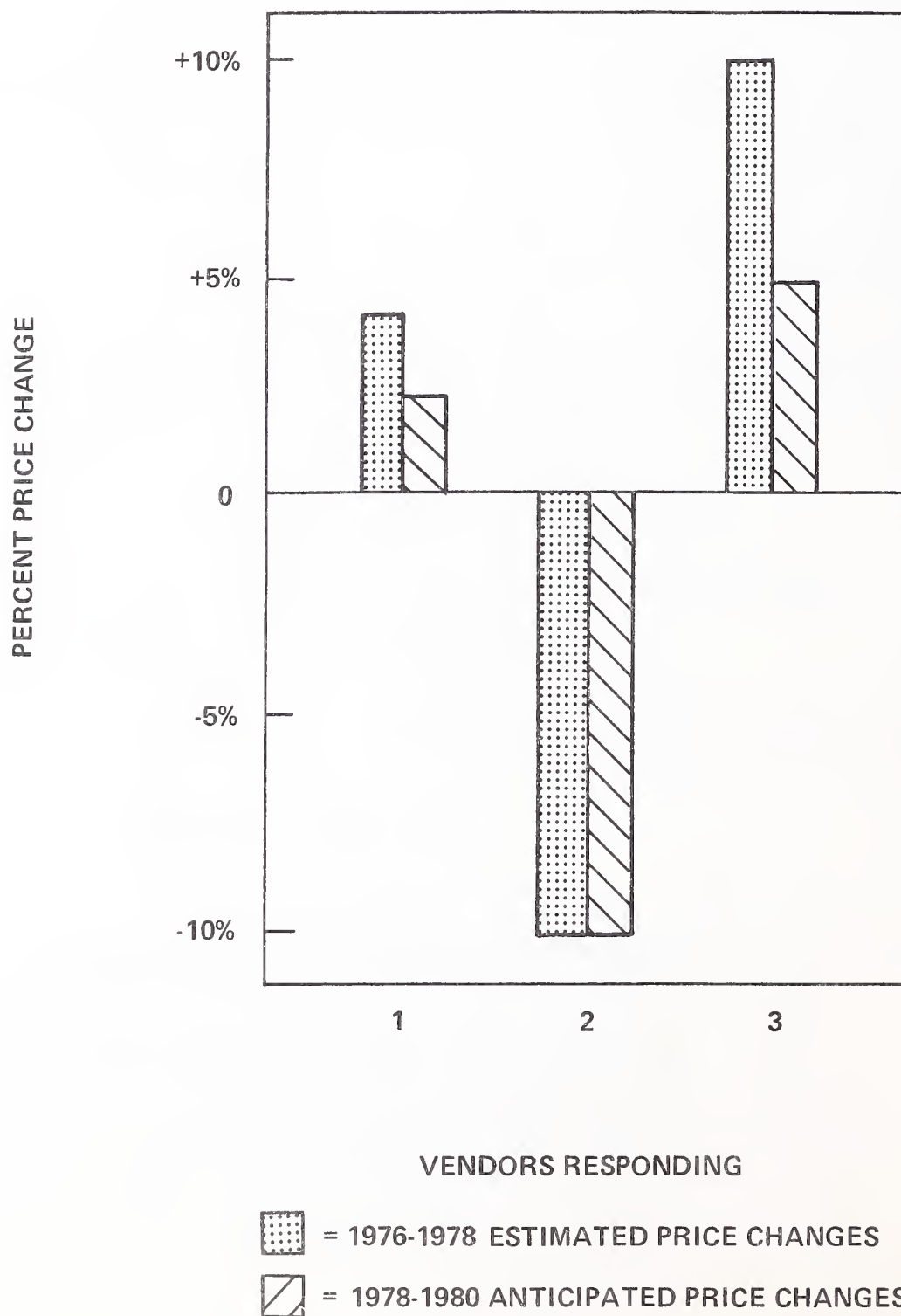
- Industry specialty products were raised an average of 5.8%, with two respondents anticipating very significant increases in 1979-1980 as shown in Exhibit III-15.

- Systems products have an average increase of 8.8%, the highest of any category. Six of seven respondents anticipate increases in 1979-1980 as shown in Exhibit III-16. These results are consistent with the price changes forecast in INPUT's recent study of "Data Base Management Systems Software." (DBMS is a major product in the systems software area.)

I.   EVALUATION OF PRICING FACTORS - SOFTWARE PRODUCTS

• Respondents rated five pricing factors in order of relative importance, with the results presented in Exhibit III-17.

- Competition from other software product vendors is the main factor in pricing policy decisions with a score of 4.1, and 44% of the first-place ratings. (It should be noted that respondents were permitted to rate more than one factor as high if they believed them to be of equal significance.) This is higher than the rating given by RCS vendors to competition from other RCS vendors, although both software products vendors and RCS vendors rated competition from their own kind as most important.

- Competition from hardware vendors was second in importance with a score of 3.4 and 22% of the first place ratings, a position slightly lower than that given by RCS vendors to the same factor.

- 35 -

INPUT

EXHIBIT III-15

RESPONDING SOFTWARE PRODUCTS COMPANIES' PRICE CHANGES
FOR INDUSTRY SPECIALTY PRODUCTS IN 1976-78 AND 1978-80

VENDORS RESPONDING

▦ = 1976-1978 ESTIMATED PRICE CHANGES

▨ = 1978-1980 ANTICIPATED PRICE CHANGES

- 36 -

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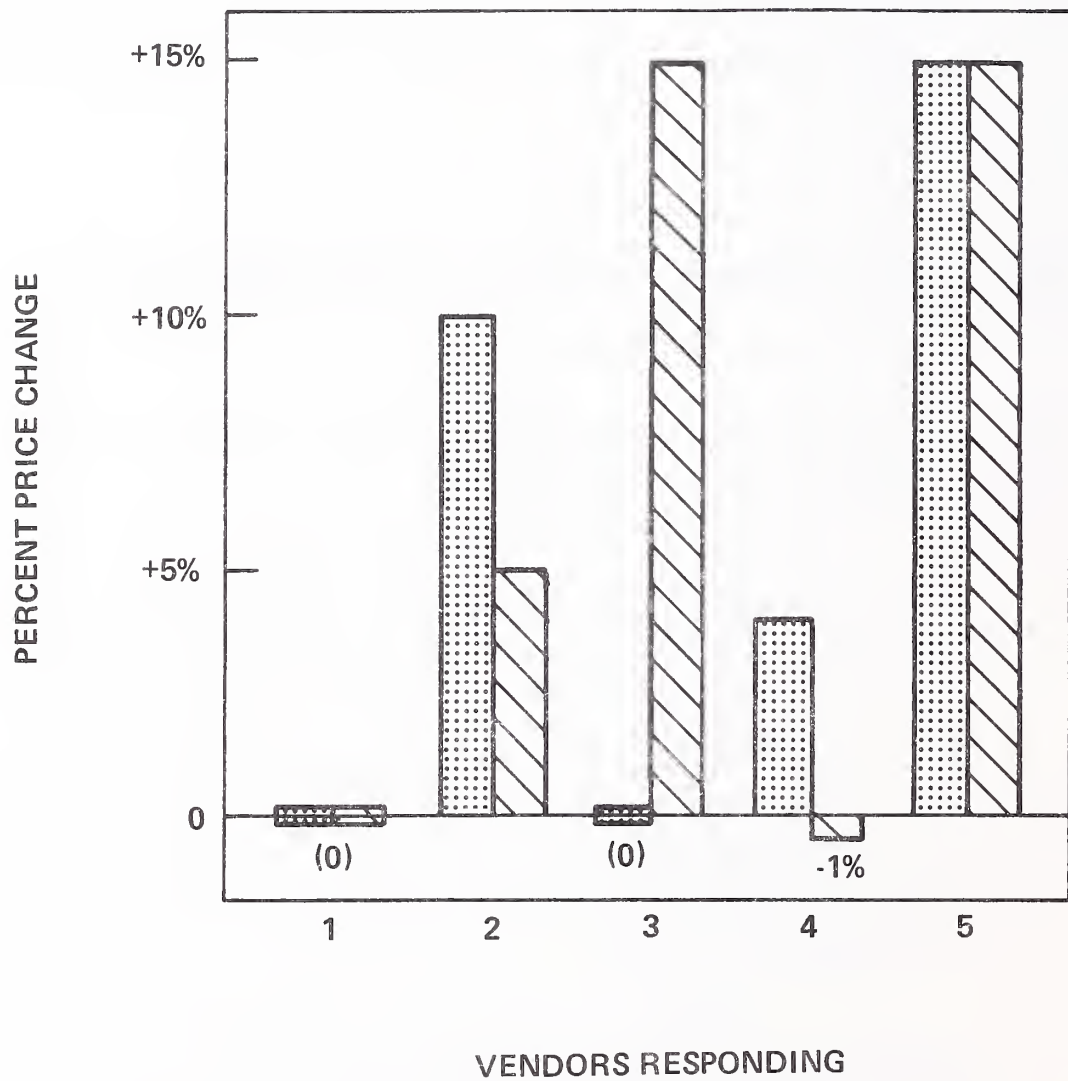
EXHIBIT III-16

RESPONDING SOFTWARE PRODUCTS COMPANIES' PRICE CHANGES

FOR SYSTEMS PRODUCTS IN 1976-1978 AND 1978-1980

VENDORS RESPONDING

▦ = 1976-1978 ESTIMATED PRICE CHANGES

▨ = 1978-1980 ANTICIPATED PRICE CHANGES

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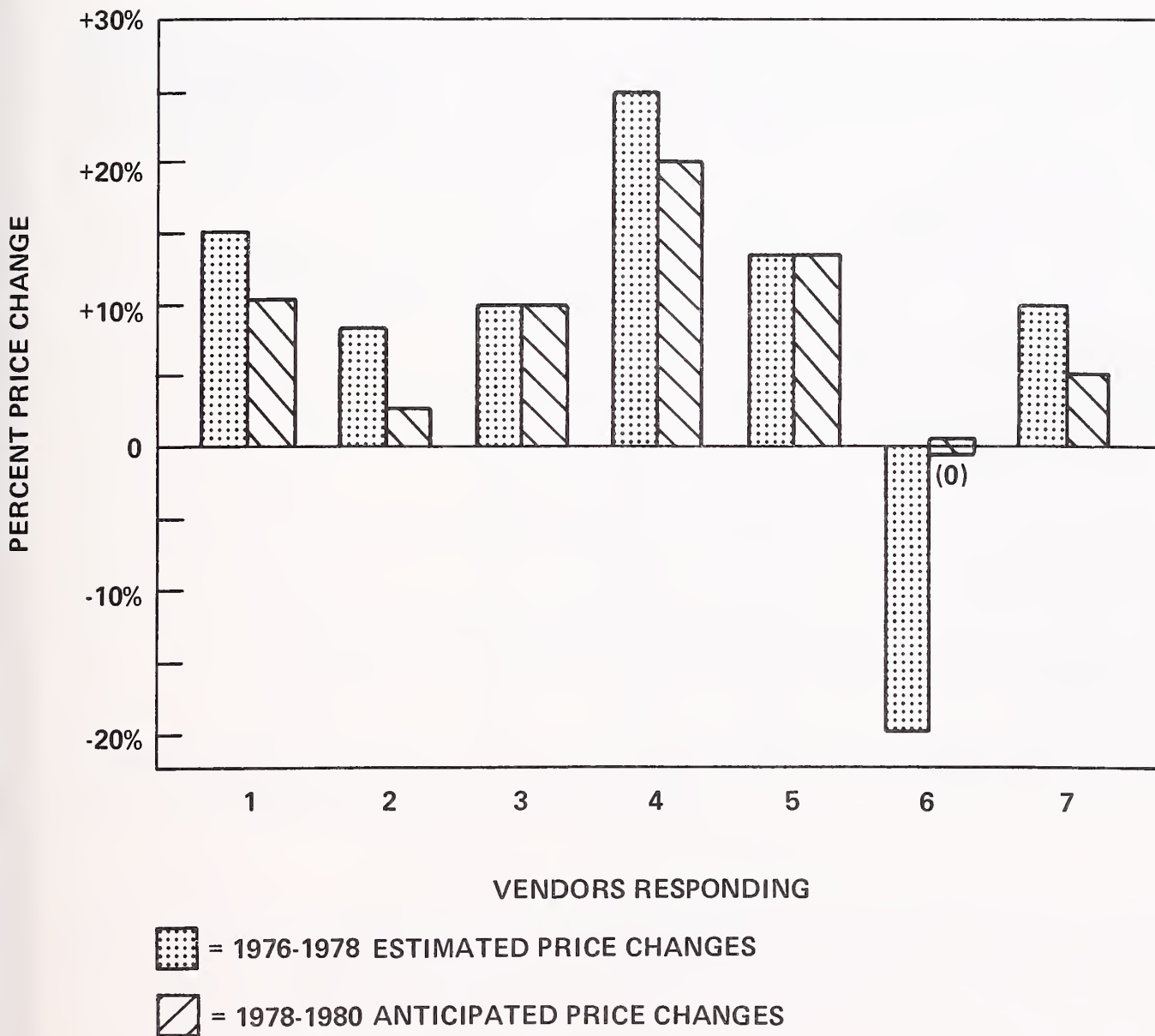
EXHIBIT III-17

RATING OF IMPORTANCE OF PRICING FACTORS BY
RESPONDING SOFTWARE PRODUCTS COMPANIES

PRICING POLICY FACTOR	AVERAGE SCORE	PERCENT VENDOR SELECTED AS MOST IMPORTANT
COMPETITION- OTHER SOFTWARE PRODUCTS VENDORS	4.1	44%
COMPETITION- HARDWARE VENDORS	3.4	22%
GENERAL ECONOMIC CONDITIONS	2.7	11%
IN-HOUSE COMPETITION	2.3	11%
FEDERAL GOVERNMENT ACTIONS	1.5	0%

(5 = HIGH, 0 = LOW)

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- With regard to other factors, it is of interest that RCS vendors placed a higher weight on general economic conditions and slightly less emphasis on in-house competition, as can be seen by comparing Exhibits III-10 and III-16.

J. IN-HOUSE COMPETITION FACTORS - SOFTWARE PRODUCTS VENDORS

- To understand how software products vendors perceive competition from in-house as a threat to their products, they were asked to rate a number of factors on a scale from 5 (high) to I (low).

  - Exhibit III-18 provides a summary of these ratings in terms of both average score and number of first place mentions.

  - Better software from hardware vendors, distributed data processing and in-house sophistication were rated almost equal in importance.

  - Greater in-house sophistication received the most first place ratings.

  - Better in-house software and security do not appear to be of particular importance in the view of respondents.

K. SOFTWARE PRODUCTS DISCOUNTING

- Vendors were asked to provide information on the various types of discounts they provided to their clients. Exhibit III-19 summarizes the results of this question.

- There appears to be a regular pattern across the industry in terms of the types of discounts offered:

INPUT

EXHIBIT III-18

RATING OF IMPORTANCE OF IN-HOUSE COMPETITION FACTORS
BY RESPONDING SOFTWARE PRODUCTS COMPANIES

COMPETITION FACTOR	AVERAGE SCORE	PERCENT VENDOR SELECTED AS MOST IMPORTANT
BETTER SOFTWARE FROM HARDWARE VENDOR	2.7	0%
DISTRIBUTED DATA PROCESSING	2.6	0%
GREATER IN-HOUSE SOPHISTICATION	2.5	25%
BETTER IN-HOUSE DEVELOPED SOFTWARE	1.4	12%
SECURITY	1.3	0%

(5 = HIGH, 0 = LOW)

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EXHIBIT III-19

- 41 -

PRICE DISCOUNTS PROVIDED BY RESPONDING SOFTWARE PRODUCTS
COMPANIES FOR 1976-78 AND 1978-80

PERCENT DISCOUNT

▦ = 1976-1978

▨ = 1978-1980

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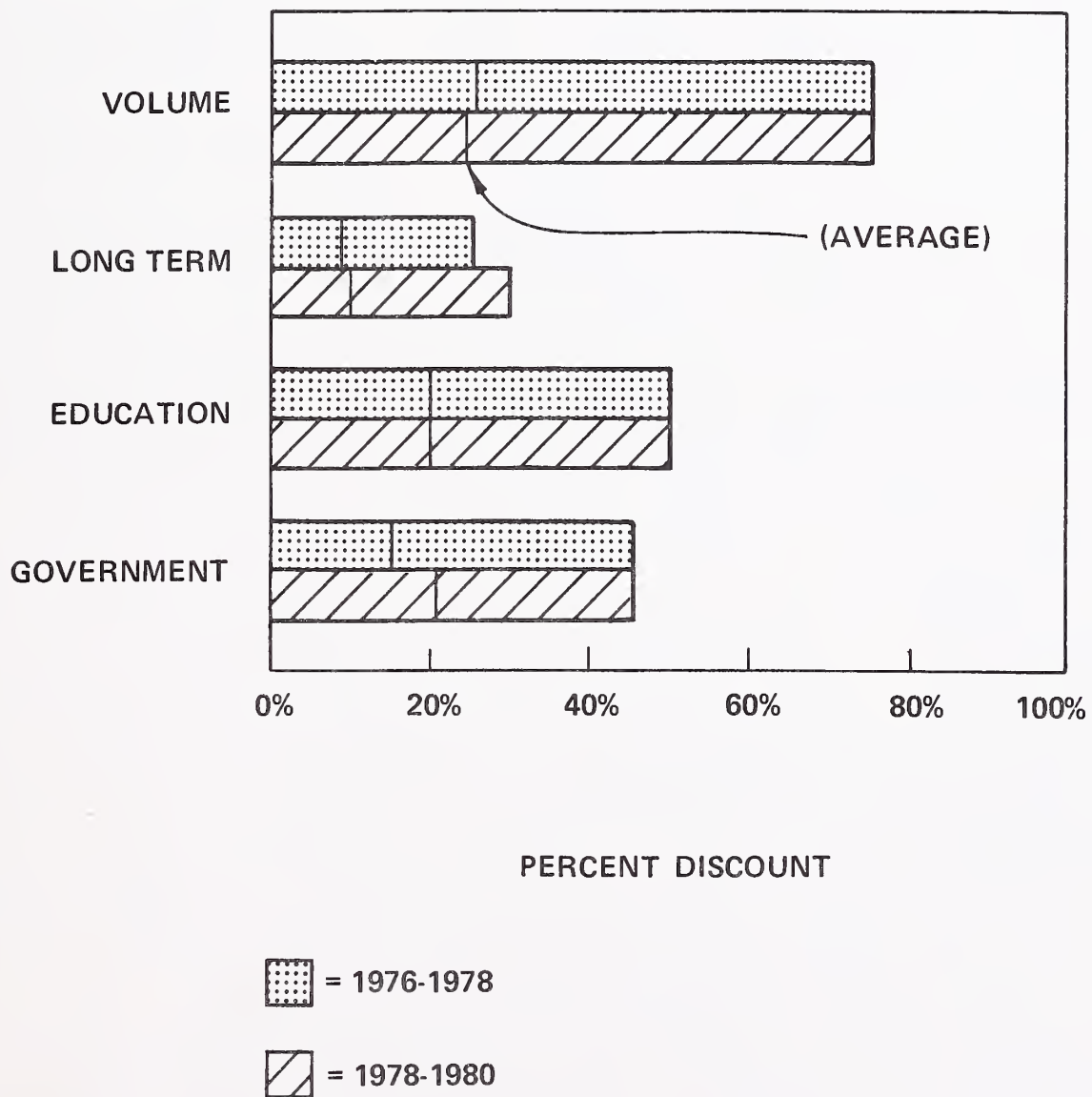
- All of the vendors provided volume discounts that averaged about 23% with large purchases yielding discounts up to 75%.

- Respondents do not expect any significant rise in these types of discounts by 1980.

- Long-term discounts were much lower, reflecting the fact that most software products are purchased rather than leased. This type of discount averages about 9%, and no major increase is expected by 1980.

- Discounting to special organizations is prevalent in the industry:

  . Educational institutions receive average discounts of about 20%.

  . Government organizations receive average discounts of about 16%.

- By 1980 government discounts will increase on the average of approximately 5%, with educational discounts remaining at their current levels.

IV USER ATTITUDES REGARDING PRICING

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IV USER ATTITUDES REGARDING PRICING

A. OBJECTIVES OF THE USER INTERVIEWS

● The user sample for this study consisted of forty telephone interviews. A breakdown of the various industry groups interviewed is contained in Appendix A. Selected information is also provided from INPUT's EDP User Panel consisting of over 400 users.

● Users interviewed were EDP managers, MIS directors, and Vice Presidents of Information Systems or Data Processing.

    – The objectives of these in-depth interviews were:

        . Determine user price experience for remote computing services and software products for the past two years.

        . Determine user price expectations for these services in 1980.

        . Determine user strategies and plans for maintaining outside services support.

- 43 -

B. USER PRICE EXPERIENCE FOR REMOTE COMPUTING SERVICES (RCS)

- 44 -

- Of the 35 users in the interview sample who were currently purchasing RCS, 37% had experienced price increases over the past two years. These price increases varied from 2% to 25%. Exhibit IV-1 shows the distribution of users' price increase experience:

    - Two of the 13 users who had experienced price increases (10% and 5%) had shifted to another RCS vendor.

    - In both cases, these users had shifted only 5% of their RCS work to new vendors.

    - Two other users who had experienced no price increases had moved all RCS activities to in-house facilities as part of their overall EDP plan.

    - One banking user had transferred 60% of his general business RCS work in-house as the direct result of a 25% price increase.

- For those users who had experienced price increases, usually an explanation was not provided by the RCS vendor:

    - None of these users indicated any contact by the RCS account manager to explain the price increases.

    - They were either notified by mail or by attachments to their monthly invoices.

- Users were generally complacent about the price increases with about one-fourth actually expecting price increases.

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EXHIBIT IV-1

PERCENT PRICE INCREASE - REMOTE COMPUTING SERVICES FOR 1976-1978

PERCENT OF PRICE INCREASE

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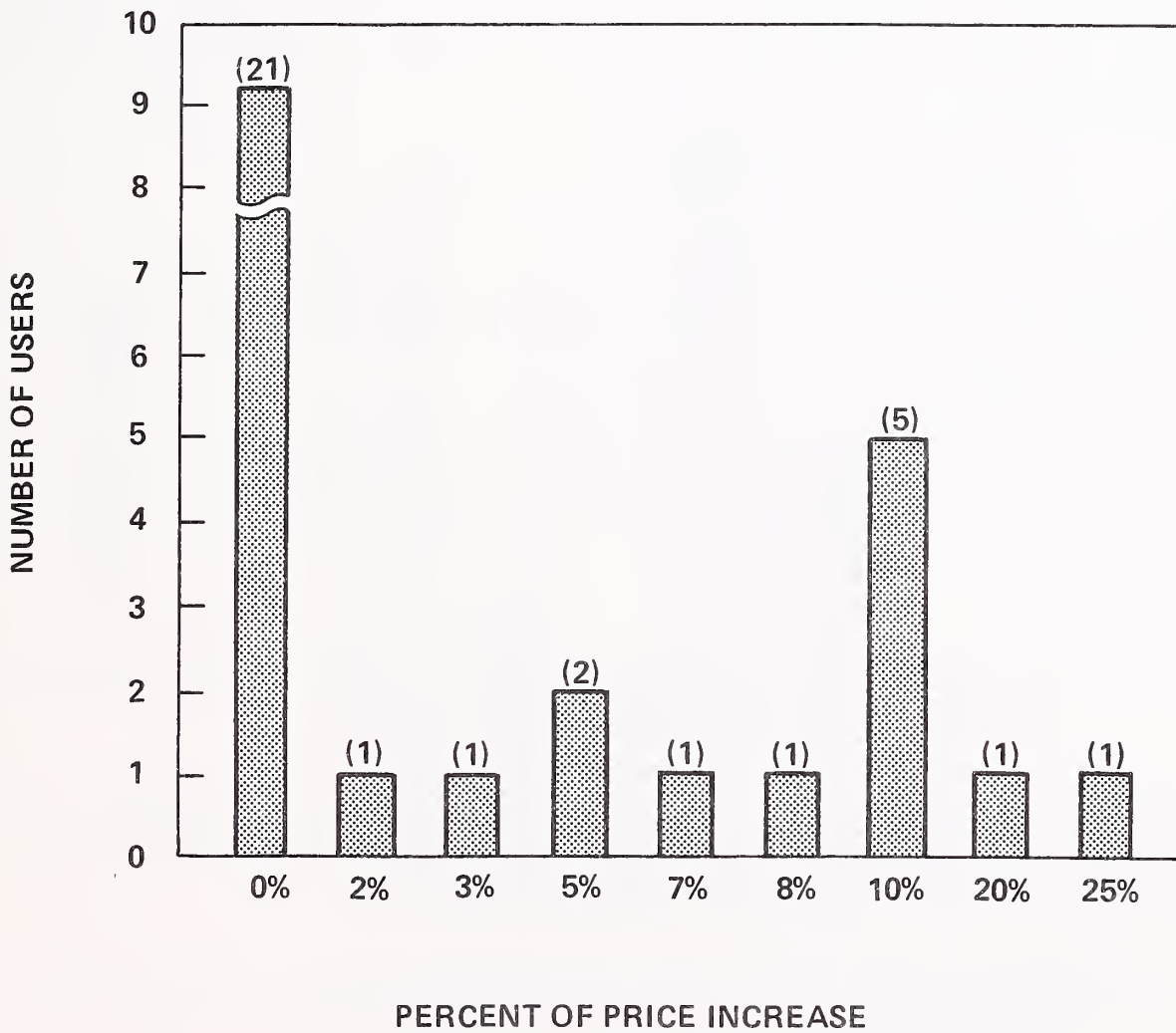
C.   USER PRICE EXPERIENCE FOR SOFTWARE PRODUCTS

- Compared to users of RCS services, there was a significantly greater number of software products users who had experienced price increases for software products over the past two years. Exhibit IV-2 shows the distribution of users' price increase experience:

    - Of the 29 users who purchased software products, 72% (21 users) had experienced price increases in purchase and/or annual maintenance fees.

    - These price increases ranged from 5-25%.

- None of the users had shifted to other software products vendors as a result of the price increases.

    - Users did express a captive attitude toward software products they had purchased. Over half of the respondents believed they had gotten themselves "locked in."

    - Although the users would have liked to use alternate sources, they did not feel it was feasible for them to make the shift.

- The software products sales personnel apparently did a better job than their RCS counterparts of explaining price increases:

    - Forty percent of the users stated they had been contacted prior to price increases.

    - The usual explanation for these price increases was increased labor costs.

- 46 -

INF

EXHIBIT IV-2

- 47 -

PERCENT PRICE INCREASE -SOFTWARE PRODUCTS FOR 1976-1978

PERCENT OF PRICE INCREASE

INPUT
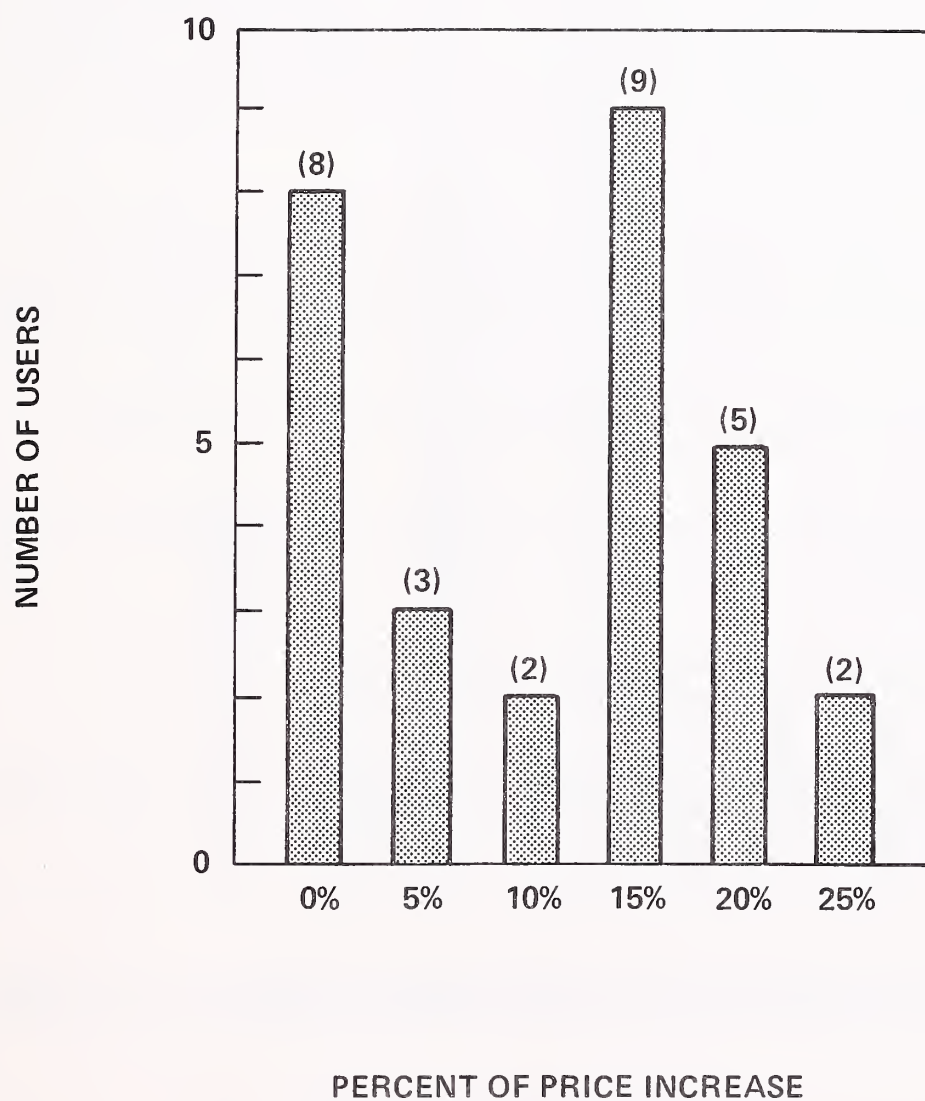
- Most of the users accepted this as a reasonable explanation and indicated they were experiencing the same increased labor costs.

D. USER PRICE EXPECTATIONS FOR REMOTE COMPUTING SERVICES - 1979-1980

- Eighty percent (28 of 35 respondents) of the users expect RCS prices to increase by 1980. These expectations ranged up to 25%. The distribution of expected price increases is shown in Exhibit IV-3. Only one of the users expected prices for RCS to decrease by 1980.

- Attitude of users to expected price increases was almost universal. It seems to reflect almost an "inflation mentality." Some typical user comments:

    - "Everything else is going up, so why not remote computing."

    - "Although hardware costs are going down, salaries are continuing to increase."

    - "Labor costs will force it to happen."

    - "System types and programmers are harder to find and want larger salaries."

E. USER PRICE EXPECTATION FOR SOFTWARE PRODUCTS - 1979-1980

- Twenty-eight of twenty-nine users who bought software products expected purchase price and/or annual maintenance to increase by 1980. Expected price increases ranged from 5-25% by 1980. Exhibit IV-4 provides a distribution of expected price increases.

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EXHIBIT IV-3

- 49 -

USER EXPECTED PRICE INCREASES BY 1980
REMOTE COMPUTING SERVICES

INPUT

EXHIBIT IV-4

- 50 -

USER EXPECTED PRICE INCREASES BY 1980
SOFTWARE PRODUCTS

PERCENT OF PRICE INCREASE

IN
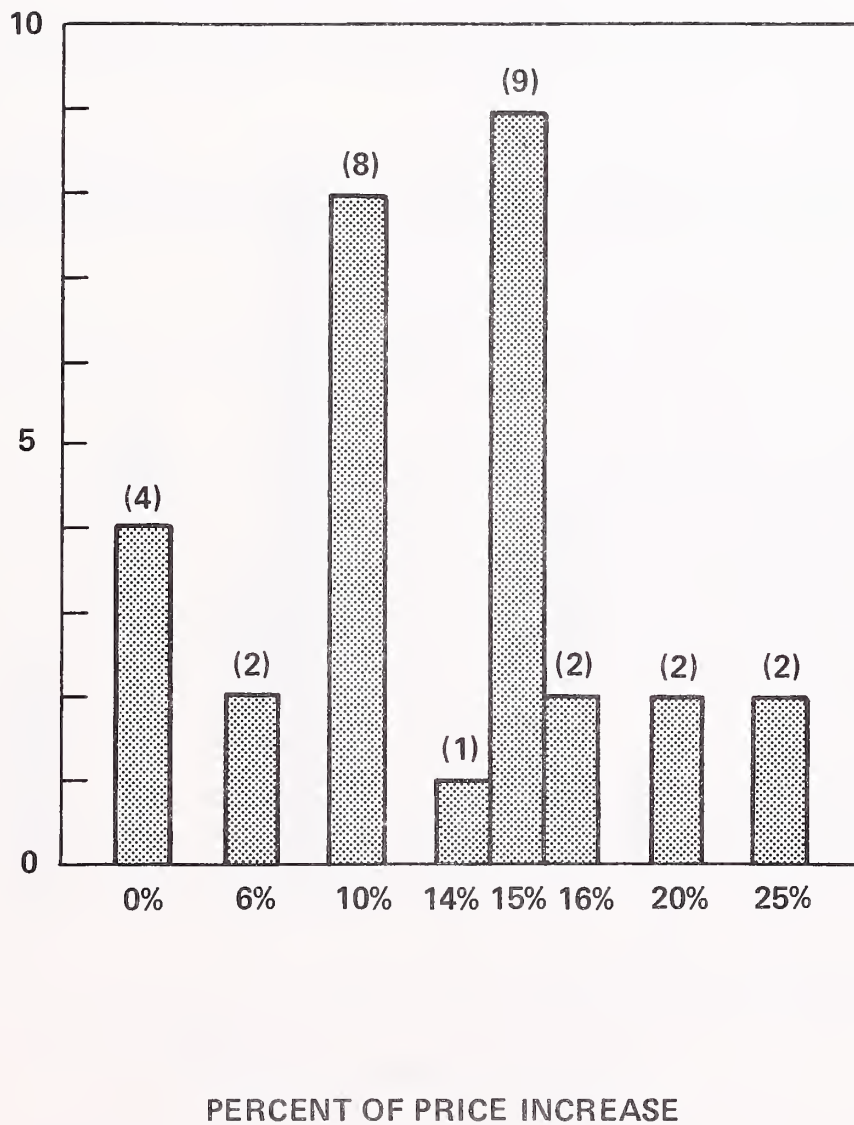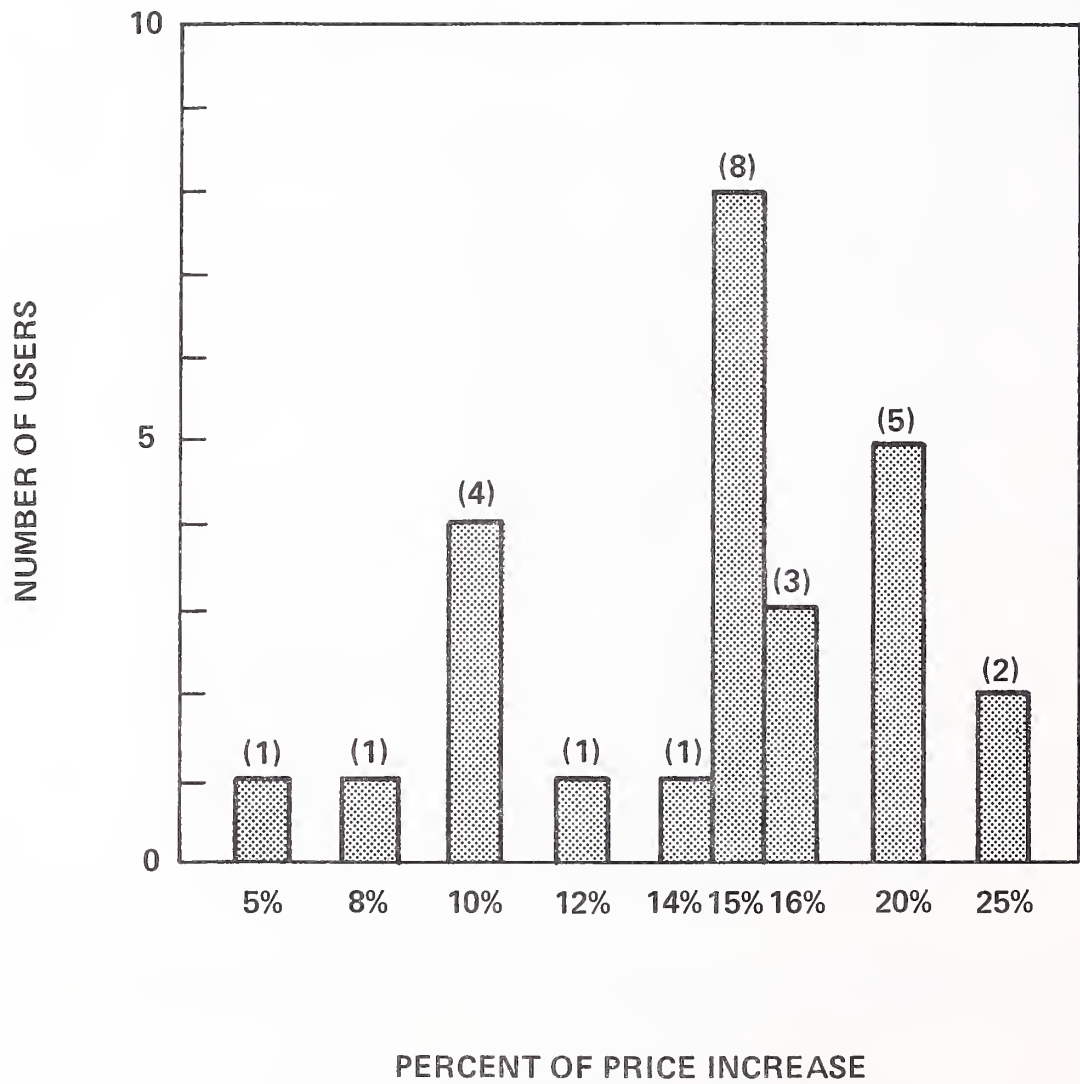
- Attitudes of users towards software product increases were very similar to those of RCS price increases:

    - "Maintenance agreements have to go up - they're labor intensive."

    - "People costs will drive up the prices."

    - "Programming costs are almost all salaries."

    - "My labor costs are going up and so will theirs."

F.   USER STRATEGIES FOR DEALING WITH PRICE INCREASES

I.   REMOTE COMPUTING SERVICES

- Since the majority of users were planning on price increases from outside vendors, they were queried on any planned shifts of computing services to in-house. For remote computing services and software products, users were asked to state the percentage of work that would be moved in-house. For RCS this varied from 0-100%. Exhibit IV-5 shows the expected distribution in RCS services by 1980 among the respondents:

    - Fifty-one percent of the users were planning on moving 50% or more of their RCS work in-house by 1980.

    - Of this 51%, ten users (30%) were planning on moving all RCS work in-house by 1980.

    - Forty-three percent of the users are planning to remain at the same level of RCS services and three users were planning on increasing their use.

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EXHIBIT IV-5

USER SHIFT FROM RCS TO IN-HOUSE BY 1980

PERCENT OF RCS TO IN-HOUSE

IN
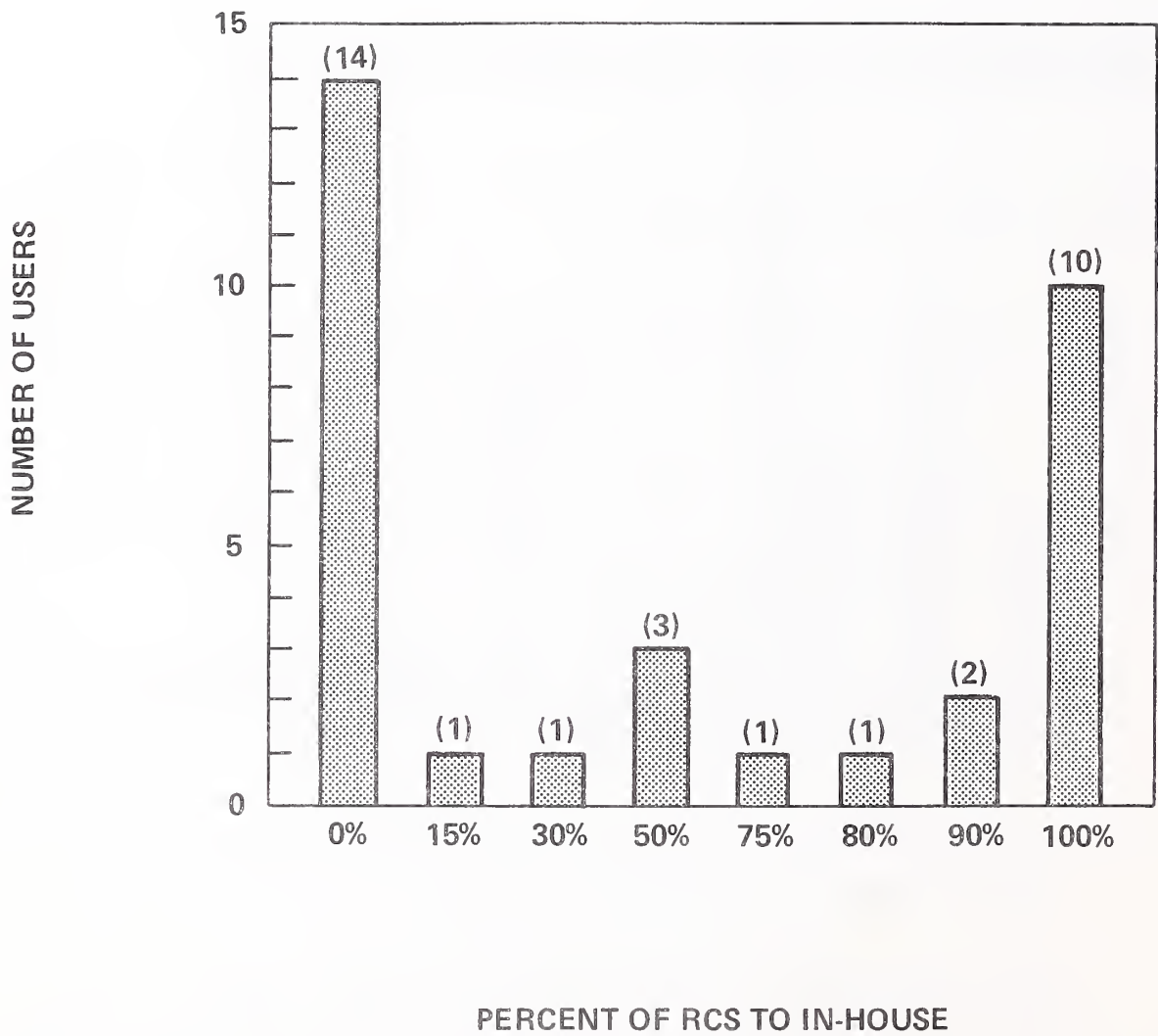
- Six percent of the users were planning moderate decreases of 15 to 30%.

- Of the users planning a 50% or more shift to in-house, there were no real unifying characteristics:

    - Six were in discrete manufacturing; 3 were in processing manufacturing; 4 were in insurance; 3 were in banking; 1 was in retail.

    - Their current annual expenditures for RCS ranged from $8K-$600K.

    - All but two users currently had various versions of IBM 360s or 370s installed.

    - All but two indicated the reason for the shift to in-house was for cost savings. These two users were doing it as part of a planned major upgrade in their hardware system.

- Representative comments by these users were:

    - "It is more economical to shift in-house because of excess time on our own machine from applications that have been dropped."

    - "All programs that are not unique will be brought in."

    - "Cost is the primary reason."

    - "Money is the big thing in this company."

    - "Better utilization of existing hardware. We are planning to bring in new hardware including minis."

    - "It is cheaper to do in-house. Lots of users are doing the same thing."

INPUT

- "We are in the process of a major hardware upgrade. We will be able to bring work in-house."

- "It is too expensive to run on outside. Our in-house costs are about 50%."

- "Minis are having a big impact."

● The primary reasons for users to remain with their RCS vendors were response time, special applications, and access to large data bases. Some typical comments are:

- "We will go to firms that have the special talents we don't have in-house."

- "We will use RCS to get new applications up quicker. Our in-house system is too slow. Users need answers now."

- "We need access to special data bases."

- "They can provide the reports we need. We don't have the data in-house."

- "We need the specialized software."

- "We can't afford to maintain economic data base in-house."

- "Our users need the planning numbers from their data base."

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2. SOFTWARE PRODUCTS

● Software products do not exhibit the same vulnerability to price increases. Only one of the users interviewed was planning to do more development in-house as opposed to purchasing software products. This represented only 10% of his development work.

- Users almost always look to the software vendors for special programs or expertise they do not possess on their own staffs. Although there is an expectation that prices will increase, there is a belief that it would still be less expensive and more timely than a comparable in-house development. Typical user comments are:

    . "Software products are cheaper and available sooner."

    . "We will continue to rely on software vendors. We can't afford to maintain staff in-house."

    . "It is too expensive to develop in-house. We cannot find qualified people."

    . "We will continue to buy and depreciate software packages."

    . "We will still use outside sources for special packages."

    . "We will continue to go to the firms who have special talent."

    . "We plan to buy on the outside because of special technical capabilities we need."

    . "It is still cheaper to use special expertise from outside. The lack of programmers is a very critical problem."

- 55 -

INPUT

3. REASONS FOR SHIFTING TO AN OUTSIDE SERVICE

● Users were asked to respond to the question of what price advantage an RCS or software products vendor would have to offer in order to move current in-house activities to the outside:

 - Only three users believed price advantages would cause them to shift from in-house, and these were 15-25% below in-house costs.

 - Generally, users did not respond to this question with specific numbers but rather cited a number of reasons other than price why this shift would or would not occur.

 - RCS Services. Some typical comments were:

   . "We would not shift for price. It would have to be an overload situation."

   . "We have extra resources in-house, wouldn't shift."

   . "Vendors can't do it cheaper because of people costs."

   . "Price is not an important consideration."

   . "We would not consider, because in-house resources would stand idle."

   . "We wouldn't go out for price break. We only go out for unique applications."

   . "Our long-range objective is an in-house centralized system. We would not consider it for price reductions."

   . "We wouldn't do for a price advantage, lose too much control."

- 56 -

INP

- "Turnaround time would do it for me, not price."

- "It is against our philosophy. Only do in critical situations."

- "We wouldn't consider for price reasons. It must be a capability I don't have."

- <u>Software Products</u>. Users' perceptions of software products are not directly affected by price advantages when compared to in-house development.

  - None of the users indicated they would move planned in-house developments to software product vendors.

  - Users view them as providing specialized capability not available in-house. Typical comments were:

  - "I don't purchase for a price advantage. I buy to get a program in use in a shorter time period."

  - "We don't consider price. Packages are used for exotic applications."

  - "I would do it only for expertise, not for price."

  - "We only use packages for special applications."

  - "We wouldn't do on a price basis; it would have to be a special package we couldn't develop ourselves."

- 57 -

INPUT

G.   RCS APPLICATION STABILITY

• In order to determine if there was currently a secure subset of RCS applications, users were questioned on those applications they would unlikely ever bring in-house:

- Forty-three percent of the users indicated that all current RCS applications were candidates for in-house operations.

- Of greater significance are the types of applications users expected to remain with their RCS vendor.

- These applications were usually associated with proprietary packages, access to large data bases used for planning and financial analysis, and modeling and simulation tools. Exhibit IV-6 provides a breakdown of the responses relative to those applications.

H.   USER REASONS FOR IN-HOUSE SHIFT OF RCS

• Users provided primary reasons for a shift to in-house from outside services. Exhibit IV-7 presents a tabulation of results: Exhibit IV-7 presents a tabulation of reasons users cited for making such a shift:

- Increased in-house hardware and/or software capability was the reason most often given by the users.

- Only 2 of 35 users stated poor RCS service as the reason for such a shift occurring.

- Lower cost was the second most prevalent reason for changing to in-house.

- 58 -

EXHIBIT IV-6

RCS APPLICATION STABILITY

APPLICATION	NUMBER OF MENTIONS
ACCESS TO LARGE DATA BASES	13
MODELS	9
SPECIAL PACKAGES	5
SIMULATIONS	7
FINANCIAL ANALYSIS	3
PAYROLL	2
ORDER ENTRY	1

INPUT

EXHIBIT IV-7

REASONS FOR SHIFT FROM RCS TO IN-HOUSE

REASON	PERCENT	NUMBER OF MENTIONS
LOWER IN-HOUSE COSTS	34%	12
INCREASED IN-HOUSE HARDWARE	26%	9
INCREASED IN-HOUSE HARDWARE & SOFTWARE	18%	6
EXCESS IN-HOUSE CAPACITY	9%	3
BETTER CONTROL	9%	3
POOR RCS SUPPORT	6%	2

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I. USER SELECTION FACTORS FOR RCS AND SOFTWARE PRODUCTS VENDORS

● In order to understand the relative importance of price among various factors considered by users during vendor selection, they were asked to rank these factors in order of importance. Exhibits IV-8 and IV-9 provide a summary of these user rankings for RCS and software products:

- Of the eight factors the users were asked to rank for RCS and software products, price was only fifth in importance.

- Only one user ranked price as the most important factor for RCS.

- No user ranked price as the most importanct factor for software products.

- Application knowledge was most important for both types of outside services; 53% ranked it first for RCS and 69% for software products.

● Clearly, technical and operations factors are much more important than price in selecting outside services.

● Over half of the users volunteered that they conducted extensive reference checking prior to selecting outside services:

- This reference checking was conducted among other users and professional user groups.

- In no case was it limited simply to the references provided by vendor sales personnel.

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USER SELECTION FACTORS-RCS

SELECTION FACTOR	AVERAGE SCORE	PERCENT USER SELECTED AS MOST IMPORTANT
VENDOR'S KNOWLEDGE OF APPLICATION	4.2	53%
VENDOR'S REPUTATION	3.3	26%
CUSTOMER SUPPORT	3.2	13%
VENDOR'S KNOWLEDGE OF INDUSTRY	2.2	0%
PRICE	1.9	3% (ONE USER)
CONTRACT TERMS	.6	0%
RESPONSE TIME	.5	0%
RANGE OF SERVICES	.5	0%

(5= HIGH, 0 = LOW)

IN

EXHIBIT IV-9

USER SELECTION FACTORS-SOFTWARE PRODUCTS

SELECTION FACTOR	AVERAGE SCORE	PERCENT USER SELECTED AS MOST IMPORTANT
VENDOR'S KNOWLEDGE OF APPLICATION	4.5	69%
VENDOR'S REPUTATION	3.8	19%
CUSTOMER SUPPORT	3.4	15%
VENDOR'S KNOWLEDGE OF INDUSTRY	2.4	4%
PRICE	2.1	0%
CONTRACT TERMS	0.8	0%
RESPONSE TIME	0.5	0%
RANGE OF SERVICES	0.7	0%

(5=HIGH, 0=LOW)

INPUT

J.   NEW USER SITE HARDWARE OFFERINGS OF RCS VENDORS

- As a result of new user site hardware offerings by RCS vendors, particularly ADP and NCSS, users were questioned about their awareness of them:

    - Forty-eight' percent of the users were aware of these hardware offerings.

    - Only one of the users was actively considering this as a planning alternative for a future upgrade of his in-house installation.

    - It appears that these offerings were just too new for most users to be actively considering them.

- To further explore this question of RCS vendors selling hardware as part of their sales program, users were queried about the purchase of minis from RCS vendors:

    - Thirty-four percent of the users indicated they would consider purchasing minis from an RCS vendor.

    - When users were asked this question, they seemed somewhat confused about the reasons why RCS vendors would be selling hardware.

    - Some typical user comments are:

        . "Why would they want to do it?"

        . "How would they maintain it?"

        . "Only if I want access to their network."

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- "If they sell specialized software with it."

- "Whoever gives me the best price."

K.   USER SATISFACTION WITH RCS BILLING PROCEDURES

- As an allied issue to pricing, users were questioned on their attitudes toward current RCS billing procedures. Users were asked to rate (5=high, 0=low) their satisfaction with current billing procedures:

    - Thirty-three of 35 users were billed monthly on a usage basis, i.e., connect time, CPU records, storage, etc. Their average satisfaction rating with this billing procedure was 3.4.

    - Only five of the users were billed monthly on a transaction basis. Their average satisfaction rating with this billing procedure was 3.8.

- Users apparently do not regard billing procedures as a major problem area. There were no strong opinions offered in either direction and it is simply regarded as a necessary part of doing business.

L.   USE OF COST COMPARISON STUDIES BY INDUSTRY SECTOR

- Prior to the selection by users of outside services and/or software, the majority of users in all industry sectors conduct cost comparison studies against in-house costs. Exhibit IV-10 displays the use of these cost comparisons by industry sector from INPUT's EDP User Panel.

- 65 -

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EXHIBIT IV-10

USE OF COST COMPARISON STUDIES OF IN-HOUSE
VERSUS OUTSIDE SERVICES/SOFTWARE BY INDUSTRY SECTOR USER

PERCENT BY RESPONDENTS

◻ = YES

▦ = NO

- 66 -

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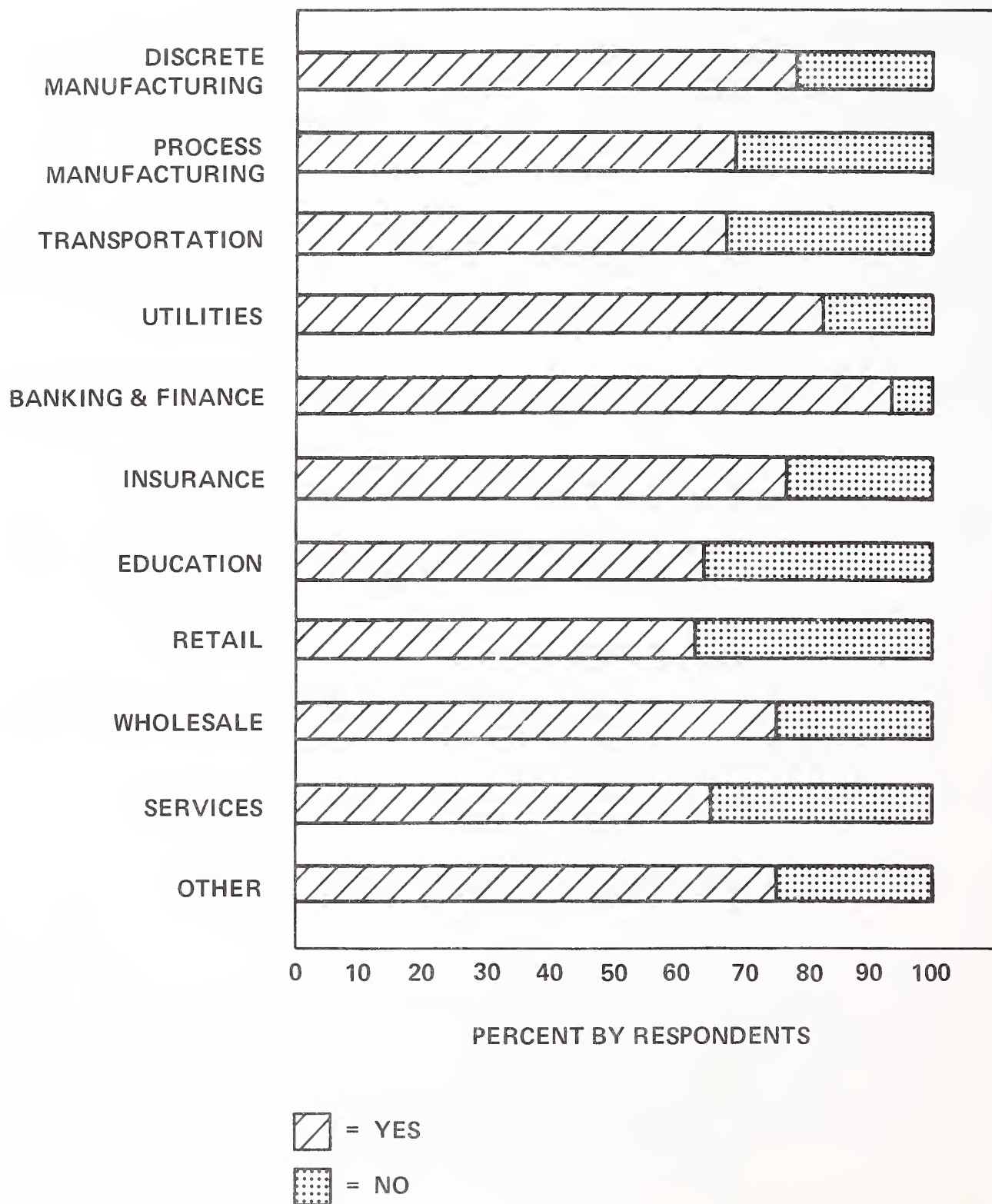
- The Banking and Insurance sectors, because of their relative high level of EDP use, almost always conduct such cost comparison studies prior to vendor selection.

- It is expected that this practice will continue to increase in all industry sectors, and vendor sales force must be prepared to deal with this as a normal part of the selling process.

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V MANAGEMENT ISSUES REGARDING
SERVICES PRICING

V   MANAGEMENT ISSUES REGARDING SERVICES PRICING

A.   THE IMPACT OF LOWER COST HARDWARE

1.   THE SERVICES DILEMMA VERSUS HARDWARE

- The combination of vendor interviews and user interviews presented in the preceding sections brings several key points into view:

    - Vendors of RCS and software products generally intend to raise prices.

    - Users expect the prices to be raised.

    - Users intend to move significant portions of RCS in-house by 1980, because they can capitalize on the use of less expensive hardware.

    - In short, responding users see the in-house solution having the long-term economic advantage versus the outside services solution.

- Hardware vendors have succeeded in making the point that their products will decline in price. For example:

    - Price/performance improvements of 7 to 10 will occur by 1983.

    - Storage costs will decrease by 25% to 40% per year.

- 69 -

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- Better peripherals will become available in a continual stream with recent entries such as laser and ink jet printers being examples. Voice input/output is expected to be a significant new development as is electronic mail equipment.

- Users believe that these improvements will happen.

• The EDP manager, who was the target of the user interviews in this study, is often not the buyer of services, particularly RCS:

- RCS vendors estimated that 50-80% and more of their revenues were sold to buyers other than the EDP manager, with more differentiated products being in the 80% and over category.

- However, as distributed processing becomes more of a factor, the EDP manager function will become more pervasive in the services buying cycle in the opinion of both vendors and users.

• The dilemma of services vendors, particularly RCS vendors, centers on how to present an image of being the best long-term alternative even in the face of lower cost hardware from hardware vendors. Results of this study indicate that hardware vendors currently are presenting the stronger case.

2.   RELATIVE IMPACT ON SERVICES VERSUS IN-HOUSE

• Services companies as well as in-house EDP establishments benefit from lower cost hardware:

- Large RCS vendors in particular are installing more efficient main-frames from IBM, Amdahl, Itel, CDC and others.

- Other RCS vendors are actively marketing hardware, as will be discussed later in this section.

- 70 -

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- As a percent of total expenditures, however, lower cost equipment is a larger portion of in-house EDP establishment budgets:

    - Depending on the user industry sector, equipment is between 20 and 40% of EDP budgets as shown in Exhibit V-1. Outside services varied between 8 and 22%, and personnel expenditures varied between 31 and 50%.

    - Computer services companies, by comparison, spent an average of 18% on equipment, as shown in Exhibit V-2. Personnel expenditures varied between 53 and 70%, depending on the type of company.

- On balance, lower cost hardware will benefit in-house installations more, and higher personnel costs will impact services companies more over the long-term.

B. SERVICES VENDORS' PRICING ATTITUDES

I. VENDORS' RATINGS OF TECHNOLOGY IMPACT

- Microprocessors are viewed by vendors as having the greatest impact, as shown in Exhibit V-3.

    - Firmware was considered important by software products vendors, but not by RCS vendors, a reflection of the tendency to see firmware as a replacement for software.

    - While memory was not rated as high by all software products vendors, some respondents saw it as most important, reflecting their involvement in memory-based products, including DBMS.

- 71 -

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EXHIBIT V-1

ESTIMATED 1977 EDP EXPENDITURES BY TYPE OF USER COMPANY

	INDUSTRY SECTOR				
EXPENDITURE CATEGORY	PERSON-NEL	EQUIP-MENT	OUTSIDE SERVICES	OTHER	TOTAL
LIFE INSURANCE	40%	31%	19%	10%	100%
DIVERSIFIED FINANCIAL	44	27	14	15	100%
BANKING	31	32	27	10	100%
RETAIL	41	39	12	8	100%
DISCRETE MANUFACTURING	47	38	5	10	100%
PROCESS MANUFACTURING	43	41	6	10	100%
TRANSPORTATION	40	35	11	14	100%
UTILITIES	39	37	16	8	100%
FEDERAL GOVERNMENT	50	20	22	8	100%
STATE & LOCAL GOVERNMENT	38	44	8	10	100%

SOURCE: INPUT REPORT "EDP PLANS AND BUDGETS FOR 1977"

IN

EXHIBIT V-2

ESTIMATED 1977 PERCENTAGE OF EXPENDITURES BY TYPE OF
COMPUTER SERVICES COMPANY

	TOTAL INDUSTRY	TYPE OF COMPANY		
		PROCESSING SERVICES COMPANIES	SOFTWARE PRODUCTS COMPANIES	PROFESSIONAL SERVICES COMPANIES
TOTAL PERSONNEL COMPENSATION AND RELATED EXPENDITURES	60%	53%	67%	70%
EQUIPMENT AND MAINTENANCE	18	20	6	10
FACILITY OPERATIONS	7	7	6	5
OTHER (COMMUNICATIONS, ADVERTISING, ETC.)	15	20	21	15
TOTAL	100%	100%	100%	100%

SOURCE: 1978 ADAPSO ANNUAL REPORT PREPARED BY INPUT.

INPUT

EXHIBIT V-3

RESPONDING VENDORS' RATINGS OF TECHNOLOGY FACTORS

TECHNOLOGY FACTOR	RCS VENDORS		SOFTWARE PRODUCTS VENDORS	
	AVERAGE SCORE*	PERCENT OF RESPONDENT SELECTING FACTOR AS MOST IMPORTANT	AVERAGE SCORE*	PERCENT OF RESPONDENTS SELECTING FACTOR AS MOST IMPORTANT
MICRO PROCESSORS	3.7	30%	3.8	44%
MEMORY	3.4	0%	3.0	22%
INPUT/OUTPUT	2.8	10%	1.5	0%
FIRMWARE	2.8	10%	3.2	11%

*RATING SCORE 5 = HIGH, 0 = LOW.
VENDORS COULD SELECT MORE THAN ONE FACTOR AS "MOST IMPORTANT."

INPU

2.   VENDORS' RATINGS OF PRICE FACTORS

• Although vendors may be concerned about impacts from technology, they are not concerned about survival, as shown by the rating in Exhibit V-4.

  - Both RCS and software products vendors rated "making profit" as the most important factor by a wide margin. In an industry where revenue growth is often interpreted to be the main factor, this emphasis on profit maximization is an indication of a shift to profit orientation.

  - The close parallel in responses across the four factors in Exhibit V-4 between RCS vendors and software products vendors is striking.

  - The total rating between the two is within 4% of each other, and the distribution is almost identical.

  - At least with regard to pricing factors, these two segments of the computer services industry are in agreement.

3.   THE RELATIVE SIGNIFICANCE OF COST FACTORS

• With regard to costs, vendors primarily set prices on the basis of personnel costs according to the interview results presented in Exhibit V-5:

  - RCS vendors felt marketing costs were "most important" more often than did software products vendors, but both rated marketing cost as second in importance overall.

  - Hardware costs rated relatively low.

• Several respondents indicated that "value of product to client" was most important. Although this element was not included in the questionnaire, its inclusion in responses indicated that it is a major price element.

- 75 -

INPUT

EXHIBIT V-4

RESPONDING VENDORS' RATINGS OF PRICE SETTING FACTORS

PRICE FACTOR	RCS VENDORS		SOFTWARE VENDORS	
	AVERAGE SCORE*	PERCENT OF RESPONDENTS SELECTING FACTOR AS MOST IMPORTANT	AVERAGE SCORE*	PERCENT OF RESPONDENTS SELECTING FACTOR AS MOST IMPORTANT
MAXIMIZE PROFIT	4.6	73%	4.5	66%
MAXIMIZE REVENUE	3.5	18%	3.5	22%
MEET COMPETITION	3.4	18%	3.3	11%
SURVIVE	1.3	9%	1.0	0%
TOTAL	12.8		12.3	

*RATING SCORE 5 = HIGH, 0 = LOW
VENDORS COULD SELECT MORE THAN ONE FACTOR AS "MOST IMPORTANT."

- 76 -

INPU

EXHIBIT V-5

RESPONDING VENDORS' RATINGS OF COST ELEMENTS
AS CONTRIBUTORS TO PRICING

COST ELEMENT	RCS VENDORS		SOFTWARE VENDORS	
	AVERAGE SCORE*	PERCENT OF RESPONDENTS SELECTING FACTOR AS MOST IMPORTANT	AVERAGE SCORE*	PERCENT OF RESPONDENTS SELECTING FACTOR AS MOST IMPORTANT
PERSONNEL	4.4	70%	4.5	77%
MARKETING	4.0	50%	4.1	33%
PROFIT	3.8	20%	3.6	33%
COMPETITORS' PRICES	3.6	10%	3.1	22%
COMMUNICATIONS	3.4	10%	1.3	0%
HARDWARE	2.7	0%	1.7	0%
SPECIAL INCENTIVE PRICES	1.8	10%	1.4	0%

* RATING SCORE 5= HIGH, 0= LOW
VENDORS COULD SELECT MORE THAN ONE FACTOR AS "MOST IMPORTANT."

INPUT

- The consensus of respondents' attitudes regarding the combined impact of technology, costs and pricing is clear:

    - Technology will have an impact, but it is not a primary concern.

    - Profits are gaining in importance as a pricing factor.

    - Personnel costs are the primary factor in determining pricing policy. (This is reinforced by other INPUT research that determined a growing services vendor concern with the higher cost and growing shortage of competent personnel.)

C.   RCS VENDOR RESPONSE THROUGH HARDWARE OFFERINGS

- All of the RCS vendor respondents indicated that they had or were planning to introduce user site hardware as a part of their services offering. This unanimous response represents a major change in the nature of the RCS business, in that hardware is becoming an almost universal part of RCS offerings.

- Relating to the recent major announcements by two RCS vendors of user site based hardware in their offerings, this issue was investigated in terms of its impact on RCS revenues. Exhibit V-6 provides a tabular summary of these two user site offerings by ADP and National CSS.

- The main reason, according to eight of ten respondents, was to protect existing service revenues.

- Respondents estimated the impact this user-site hardware would have on their current RCS revenues. The impact varied by mode and type of service:

INPU

EXHIBIT V-6

ADP AND NCSS HARDWARE OFFERINGS

FUNCTION	ADP	NCSS
SYSTEM		
● MINI	DEC 2020	SYSTEM 3200
● WORD SIZE	32 BIT	32 BIT
● MEMORY (MAX. SIZE)	2.5M BYTES	2M BYTES
● DISC (MAX. SIZE)	1.5M BYTES	2B BYTES
● STANDALONE	NO	YES
● HOST SYSTEM NETWORKING	YES	YES
● VAN NETWORKING (PACKET SWITCHING)	YES	YES
● SALE	NO	YES
● LEASE	YES	YES
● BUNDLED SERVICE	YES	NO
● TERMINALS	16 - 32	1 - 32
● LINE PRINTER	300 - 600/ PM	300 - 1,000/ PM
● ENVIRONMENT	OFFICE	OFFICE
● COST (RANGE)	$10,000 - 16,000/ MO. (24 - 36 MONTH LEASE)	$185,000 - $800,000 (PURCHASE)

- 79 -

INPUT

EXHIBIT V-6 (CONTD.)

ADP AND NCSS HARDWARE OFFERINGS

FUNCTION	ADP	NCSS
SYSTEM (CONTD.)		
MAINTAIN	YES	YES
DOWN LINE PROGRAM LOADING	YES	NOT YET ANNOUNCED
REMOTE FAULT DIAGNOSIS	YES	NOT YET ANNOUNCED
MAINTENANCE MICROPROCESSOR	YES	NOT YET ANNOUNCED
MULTI - LEVEL DATA SECURITY	YES	YES
MONITORING SERVICE USAGE	YES	NOT YET ANNOUNCED
SOFTWARE		
OPERATING SYSTEM	DEC	VPS
COBOL	YES	YES
FORTRAN	YES	YES
PL/ 1	YES	YES
DATA BASE (1)	IDL	NOMAD
FINANCIAL (1)	TSAM, FML	ESL
PROJECT MANAGEMENT (1)	APECS	YES
GRAPHICS (1)	YES	YES
TEXT PROCESSING (1)	YES	YES

INP

- With regard to remote computing services, respondents forecast a remarkably symmetric range of responses from -35 to +20% as shown in Exhibit V-7.

- By comparison, the impact on batch services was felt to be basically positive, as shown in Exhibit V-8. Evidently, less replacement of current revenues by user-site hardware is anticipated for batch revenues than RCS revenues by the respondents.

- The impact on general business services revenue was viewed differently by the respondents, reflecting the widely different offerings in this type of service. As shown in Exhibit V-9, some respondents expect to replace some RCS revenues with user-site hardware, while others anticipate significant new revenues.

- Scientific and engineering services revenues are expected to change little or decline due to user-site hardware as presented in Exhibit V-10.

- Industry specialty services show the widest range of respondent estimates, from -35 to +50% impact on revenues, as shown in Exhibit V-11.

- Utilities services also show a wide range based on respondent estimates, as shown in Exhibit V-12.

- While responding RCS vendors see some decline in overall RCS revenues due to self-impact as shown in the preceding exhibits, they individually feel that user-site hardware will be a significant contributor to revenues by 1980. As shown in Exhibit V-13:

    - All eight respondents expect to have revenues from user site hardware by 1980, with two respondents estimating a 20% contribution.

- 81 -

INPUT

EXHIBIT V-7

RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF
USER SITE HARDWARE ON EXISTING REMOTE COMPUTING SERVICES

- 82 -

INPU

EXHIBIT V-8

RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF

USER SITE HARDWARE ON EXISTING BATCH SERVICES

RESPONDING VENDORS

NC = NO CHANGE

INPUT

EXHIBIT V-9

RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF
USER SITE HARDWARE OF EXISTING GENERAL BUSINESS SERVICES

(NC) = NO CHANGE

INPI

EXHIBIT V-10

RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF
USER SITE HARDWARE ON EXISTING SCIENTIFIC & ENGINEERING SERVICES

RESPONDING VENDORS

(NC) = NO CHANGE

INPUT
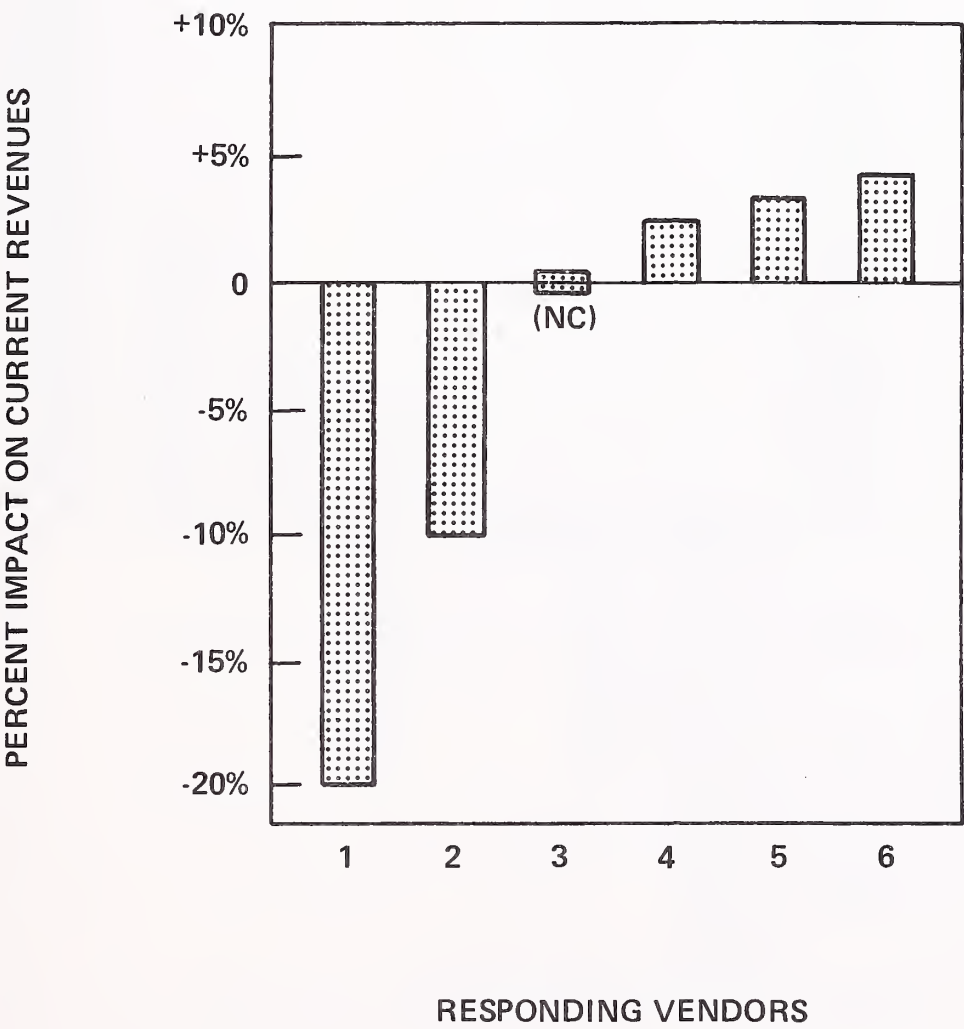
EXHIBIT V-11

RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF
USER SITE HARDWARE ON EXISTING INDUSTRY SPECIALTY SERVICES

RESPONDING VENDORS

(NC) = NO CHANGE

INPU
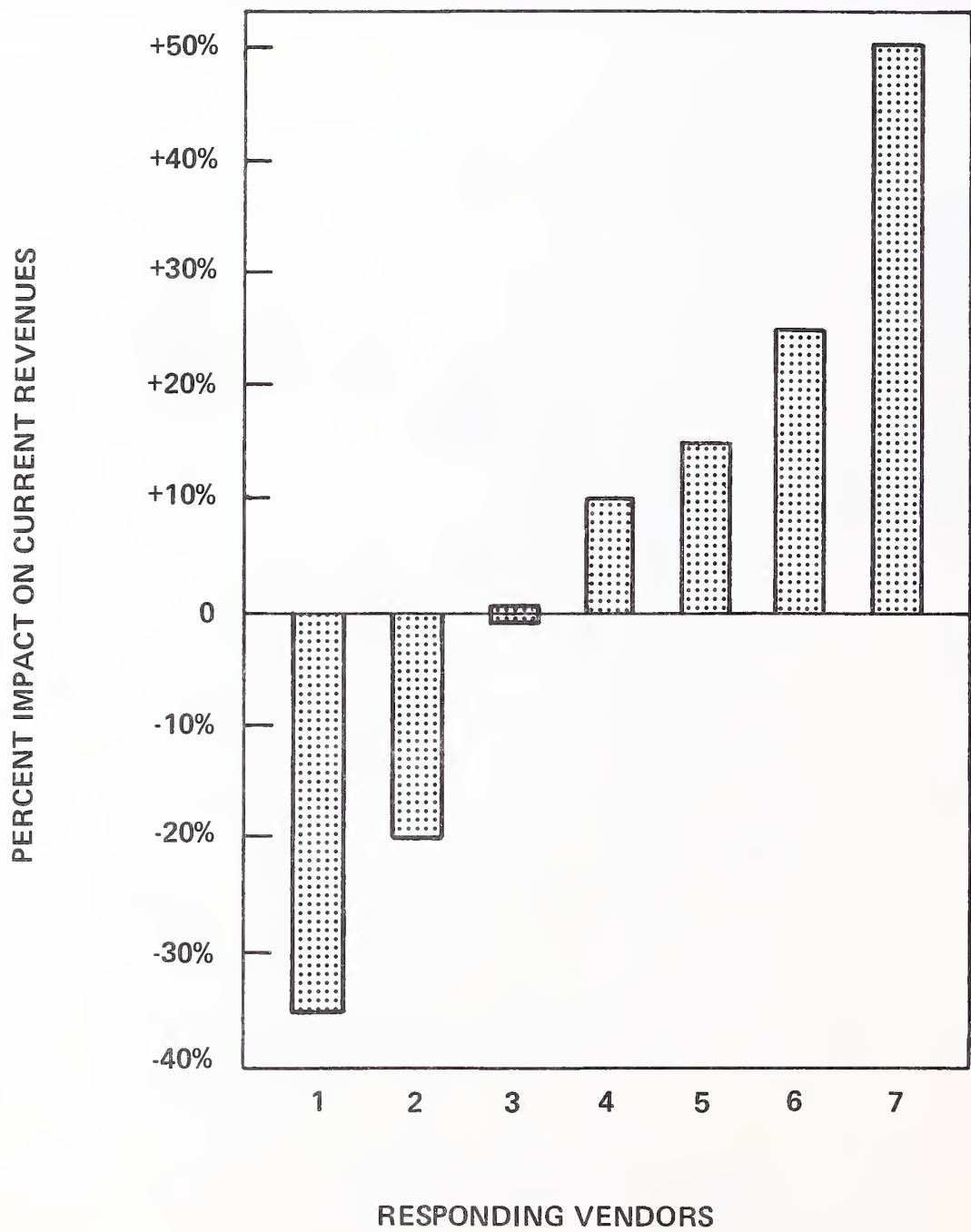
EXHIBIT V-12
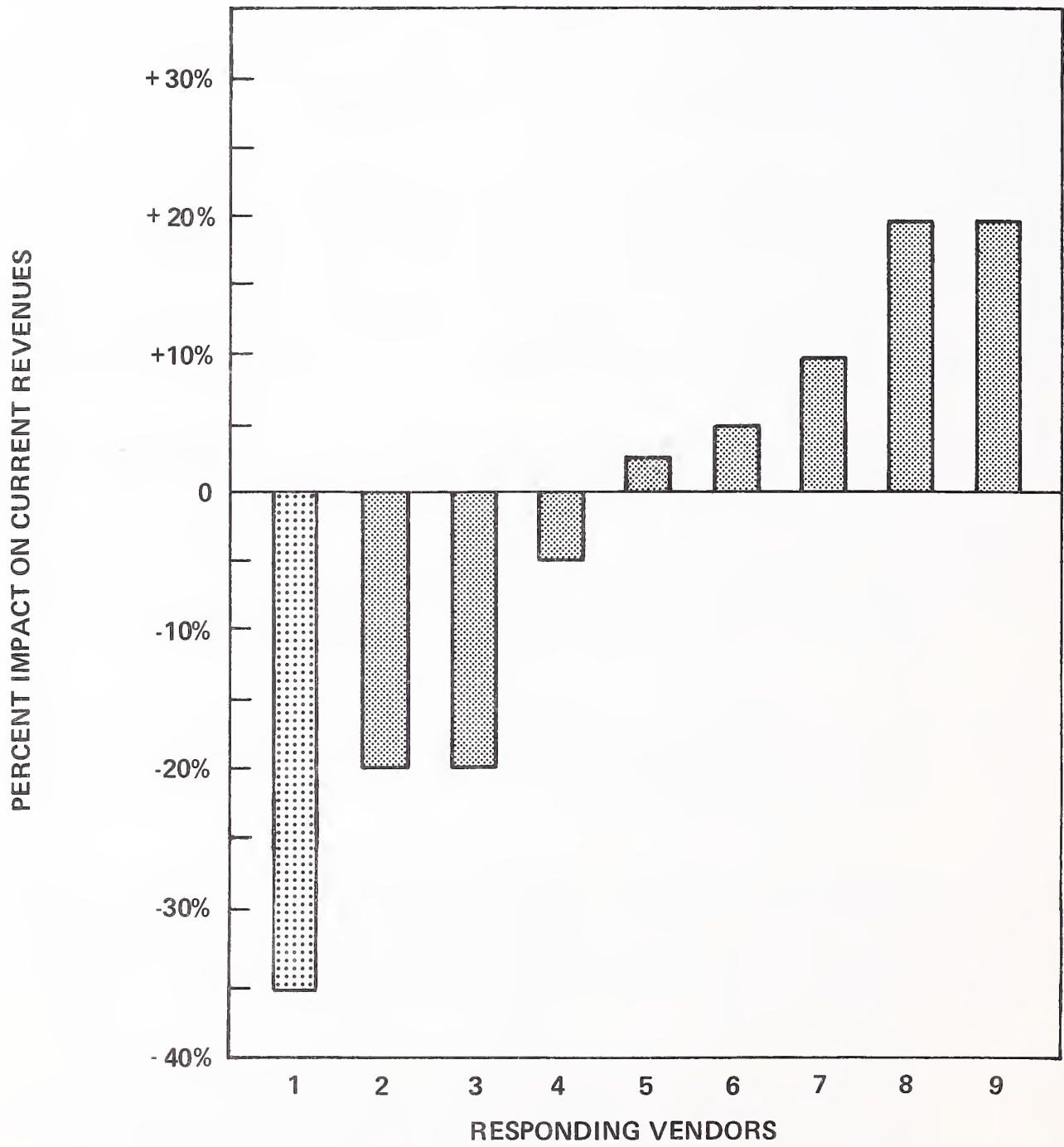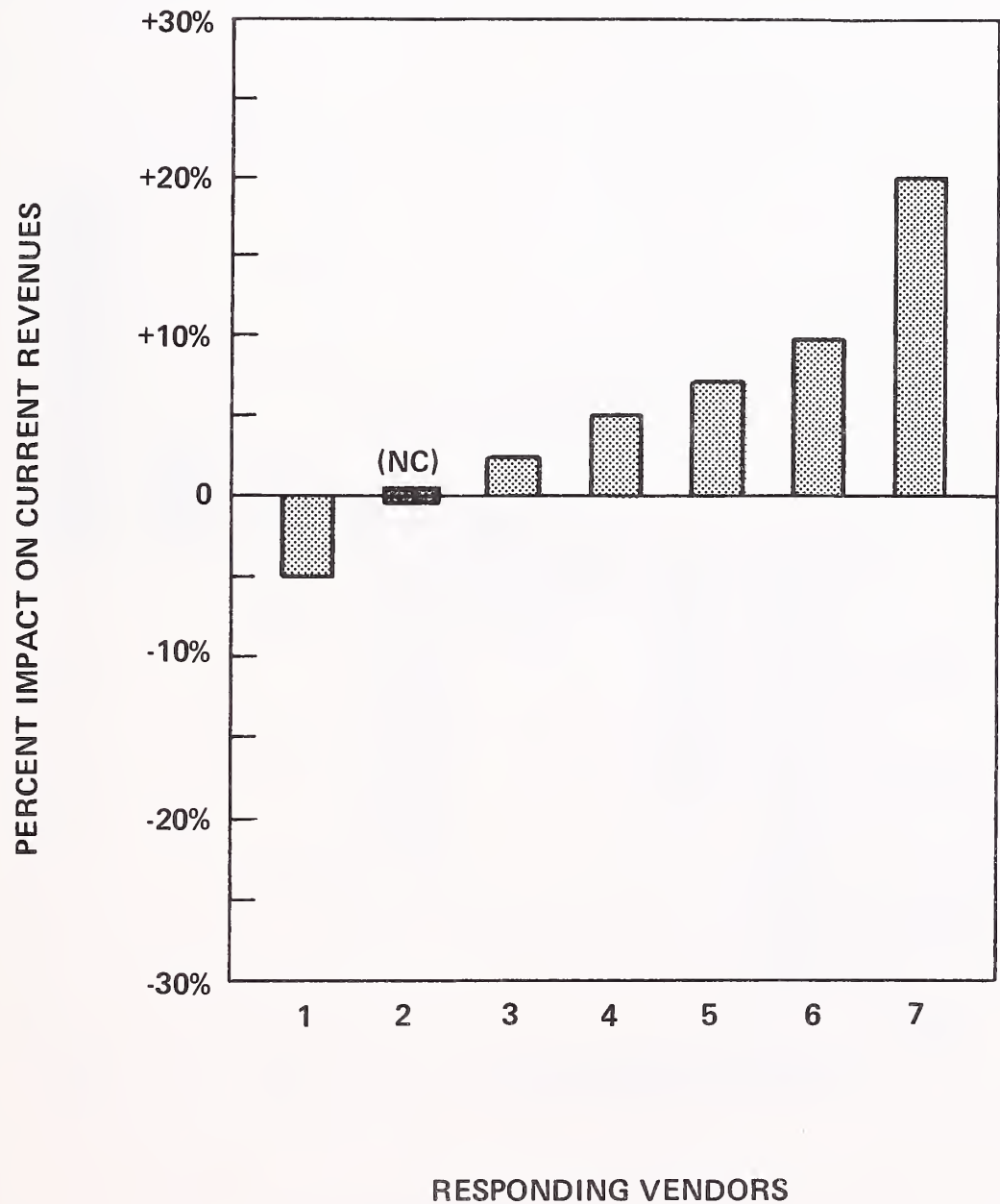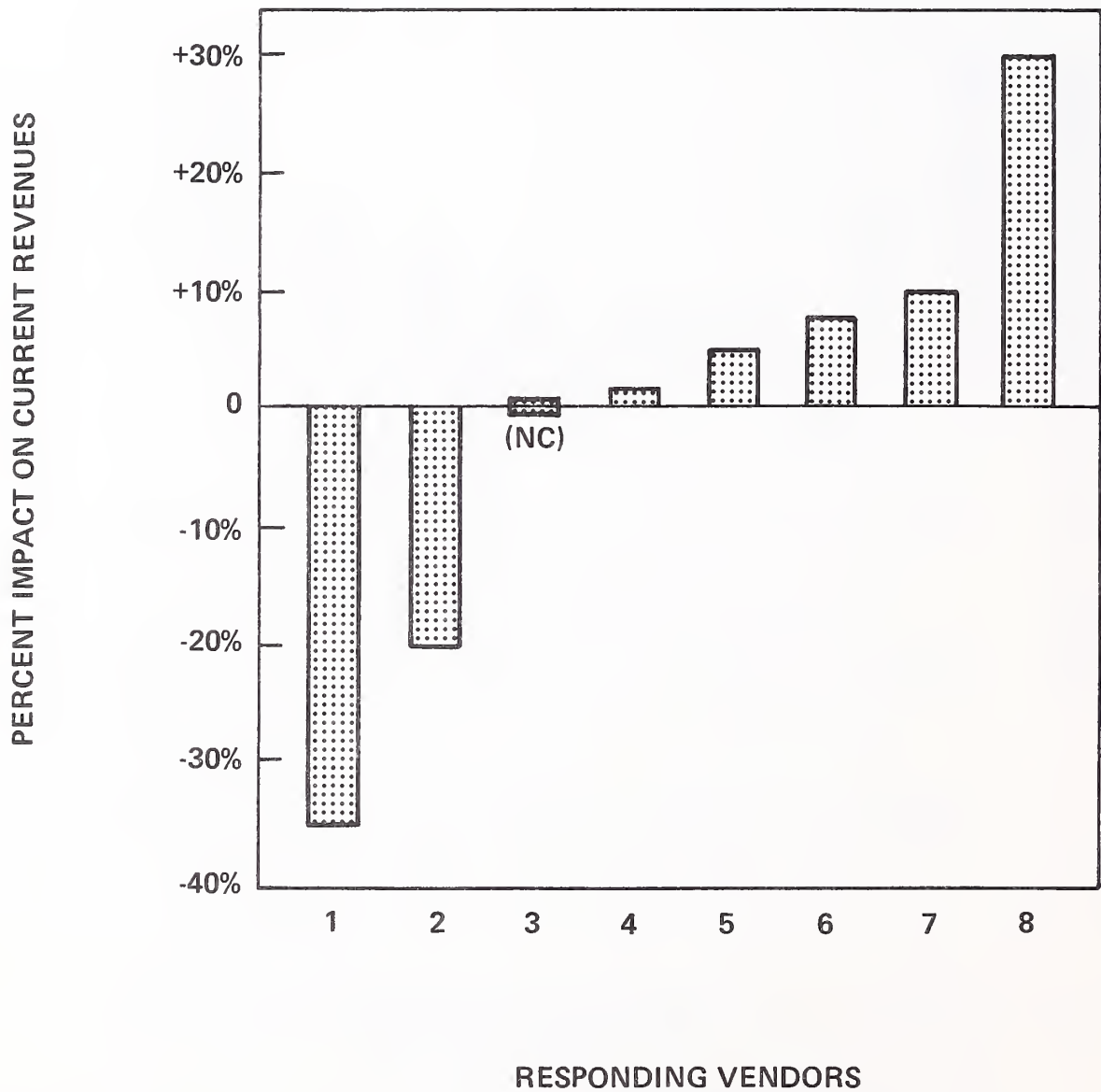
RESPONDENTS' ESTIMATES OF CURRENT POTENTIAL SELF IMPACT OF
USER SITE HARDWARE ON EXISTING UTILITIES SERVICES

(NC) = NO CHANGE

INPUT
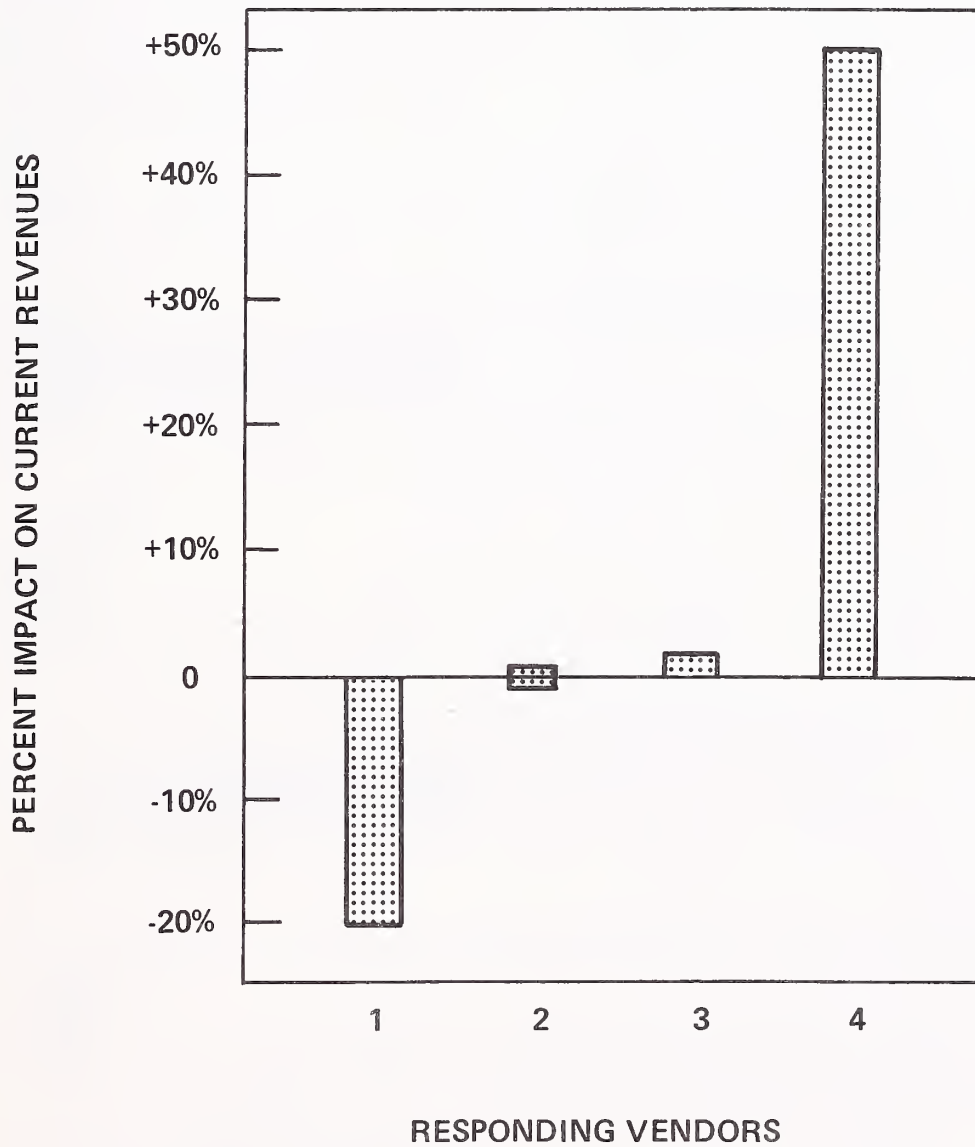
EXHIBIT V-13

RESPONDENTS' ESTIMATES OF THREE YEAR REVENUE CONTRIBUTION OF
USER SITE HARDWARE TO RCS SALES
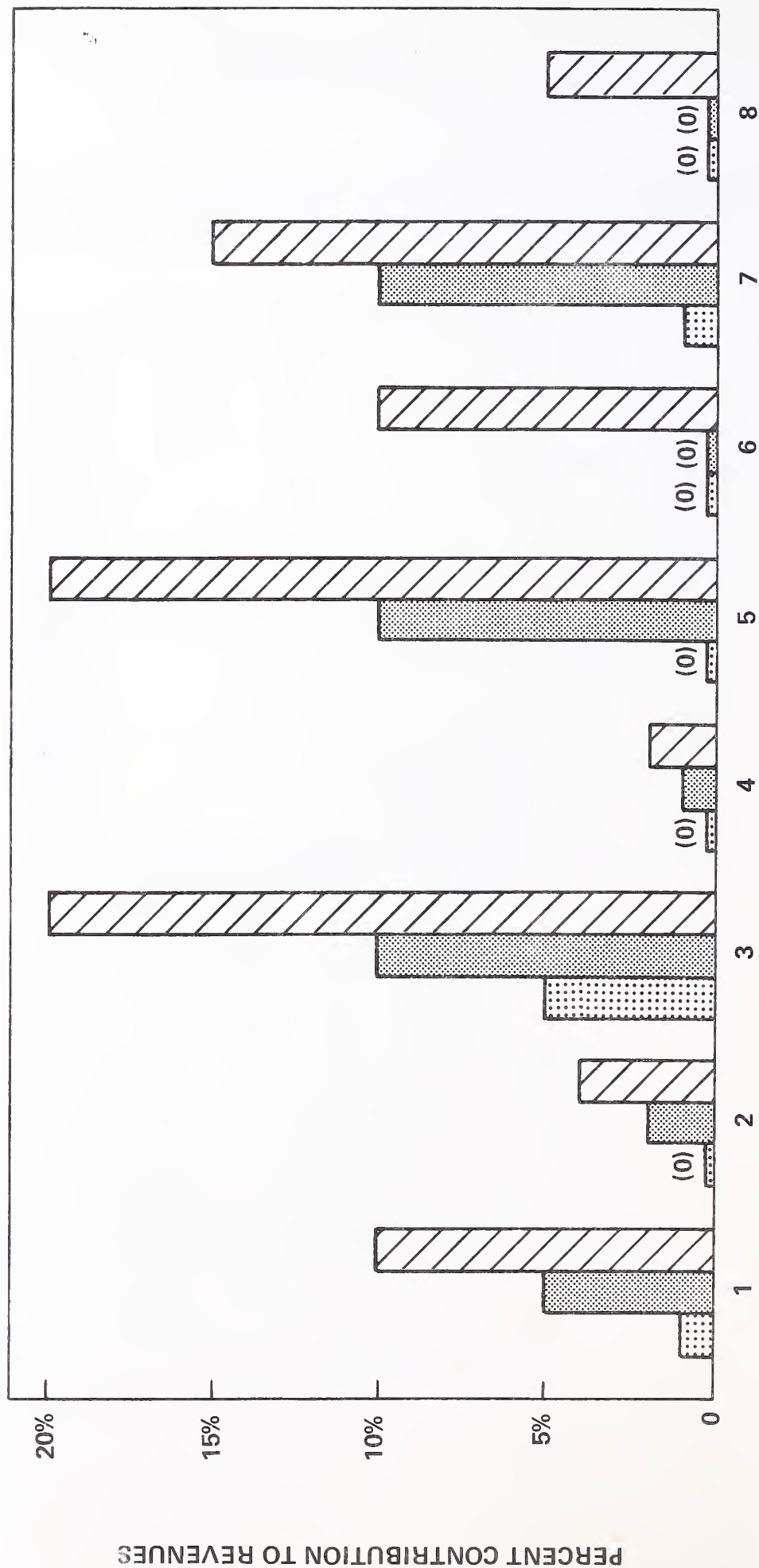
NOTE: THREE RCS COMPANIES DID
NOT RESPOND TO QUESTION.

RESPONDING VENDORS

PERCENT CONTRIBUTION TO REVENUES

▨ = 1978   ▨ = 1979   ▨ = 1980

INPU

- Of significance is the fact that only two of the eight currently have such revenues. Obviously, a number of on-site hardware announcements will be made in the latter half of 1978 as RCS vendors implement their plans for 1979 and 1980 revenues.

- In conclusion, RCS vendors are moving almost universally to incorporating user site hardware as a means of providing competitive solutions versus hardware vendors.

- The most revealing aspect of these exhibits is the lack of agreement among the respondents in terms of impact on their revenues by both mode and type of service:

  - On the average remote computing would be reduced by 13%, but the range of expectations was from a reduction of 35% to an increase of 25%.

  - Batch services showed an average increase of about 8%, but the ranges were from a minus 5% to an increase of 20%.

  - General business is expected to have an average increase of about 8%, but again the range is from a minus 35% to a 30% increase in revenue.

  - Similar wide variations also exist for industry specialty and utilities.

  - Scientific and engineering shows more consistency with an average expected drop in revenues of about 4% with a range from minus 20% to 4% increase.

- With regard to methods to be used to finance and maintain these hardware offerings, respondents varied among available alternatives:

  - Financing alternatives included internal funding, user purchase, lease limited partnership, and "debt."

INPUT

- Maintenance alternatives included hardware vendor, own maintenance force, and third-party maintenance.

INPU

APPENDIX A: INTERVIEW SAMPLE

EXHIBIT A-1

- 91 -

INPUT

USER PHONE INTERVIEW SAMPLE

INDUSTRY	NUMBER OF USERS INTERVIEWED
PROCESS MANUFACTURING	6
DISCRETE MANUFACTURING	13
BANKING	9
INSURANCE	7
WHOLESALE	3
RETAIL	2
TOTAL	40

VENDOR INTERVIEW SAMPLE

TYPE OF COMPANY	NUMBER OF VENDORS' INTERVIEWED
REMOTE COMPUTING SERVICES	10
SOFTWARE PRODUCTS	5
TOTAL	15

INPUT

INPU

APPENDIX B: QUESTIONNAIRES
USER
VENDOR

USER QUESTIONNAIRE

INPUT Confidential

1. All information provided in this questionnaire will be confidential. INPUT will not identify who participated in this survey.

EDP EXPENDITURES

1. What are your approximate EDP expenditures?

2. What percent are for in-house expenses? _____

               for outside services? _____

3. For outside services, what percent are for Remote Computing Services? _____

               for Applications software packages? _____

               for System software packages? _____

4. What are your other outside EDP expenditures? _____

_____

_____

5. For Remote Computing Services and Software Products, what is your percent of expenses among the following categories?

	Remote Computing	Software Products
General Business	_____	_____
Scientific & Engineering	_____	_____
Industry Specialty	_____	_____
Systems & Utilities	_____	_____

INPUT

6. Please check how you are billed for outside services and your level of satisfaction (5 = high, 0 = low) with the billing method.

	RCS Service		Software Product	
	Check	Satisfaction	Check	Satisfaction
Application/Fixed Price	____	_____	____	_____
Usage	____	_____	____	_____
Transaction	____	_____	____	_____
Weekly	____	_____	____	_____
Monthly	____	_____	____	_____
Other (specify)	____	_____	____	_____

7. What vendor has the best billing procedure? _____

Why? _____

8. Please rate your billing (5 = high, 0 = low) in terms of the following factors:

	Outside Services	In-House Services
Clarity	_____	_____
Accuracy	_____	_____
Reasonableness	_____	_____
Audit Trial	_____	_____
Other (specify)	_____	_____

9. How would you like to see your current billing procedures changed?

Outside Services: _____

_____

In-House Services: _____

_____

INPUT

10. For the past two years, please indicate the percent increase for outside services:

                                                              Percent Increase

    Remote Computing Services   _____

    Software Products   _____

11. How did your vendor explain these increases in price?

_____

_____

_____

12. As a result of these price increases, what percent have you shifted to other vendors?

                                                              Percent Shifted

    Remote Computing Services   _____

    Software Products   _____

13. What percent increase in prices do you expect in outside services by 1980?

                                                              Percent Increase

    Remote Computing Services   _____

    Software Products   _____

14. For those EDP activities you are currently performing in-house, what price advantage would an RCS vendor have to offer in order to shift to an outside service? _____

_____

15. For those EDP developments you are currently considering performing in-house, what price advantage would an RCS or Software vendor have to offer to consider him for the development?

_____

_____

_____

INPUT

16. For those Remote Computing Services that are currently being supplied, what changes would have to occur for you to bring them in-house?

_____ - 96 - _____

_____

_____

17. At what monthly billing rate (due to volume) would you bring current outside services in-house?

_____

18. What applications are you unlikely <u>ever</u> to bring in-house? _____

_____

_____

19. At what level(s) in your company are the final decisions made for:

Remote Computing Services: _____

Software Products: _____

20. Where, other than the EDP Department, can services and products be purchased?

_____

21. Is the EDP Manager involved in these purchase decisions? _____

22. A number of RCS vendors are now offering hardware in the customer's facility as a complement to RCS. Are you aware of these offerings?

Yes _____

No _____

23. If yes, are you actively considering incorporating them into your installation?

Yes _____

No _____

24. What will this hardware consist of? _____

_____

_____

25. When do you expect the hardware to be installed? _____

26. How is the hardware being financed? _____

_____

27. How will the hardware be maintained? _____

_____

28. What were your major reasons for selecting this hardware option?

_____

_____

_____

29. In terms of your own long range EDP plans, what percent of RCS will
    be shifted to in-house operations?

    _____

30. Why will this shift occur? _____

_____

_____

31. In terms of your own long range EDP plans, what percent of outside
    Software Product purchases will be shifted to in-house development?

    _____

32. Why will this occur? _____

_____

_____

INPUT

33. In selecting a vendor, a number of factors are considered. Would you please rate (5 = high, 0 = low) the following factors in order of importance.

FACTOR	RCS	SOFTWARE PRODUCT
Vendor's knowledge of application	_____	_____
Vendor's knowledge of your industry	_____	_____
Vendor's reputation (reliability	_____	_____
Customer Support (documentation, maintenance, etc.)	_____	_____
Price (esp. discount practices)	_____	_____
Contract terms	_____	_____
Response time	_____	_____
Range of services	_____	_____
Others (please specify	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

VENDOR QUESTIONNAIRE

INPUT CONFIDENTIAL

- 99 -

1. All information provided in this questionnaire will be confidential.
    INPUT will not identify who participated in this survey.

2. The questionnaire is divided into two parts. The first part deals
    with Remote Computing Services and the second with Software Products.
    Please complete the part(s) appropriate for your company.

A. REMOTE COMPUTING SERVICES (RCS)

1. What percentage of your RCS is priced using the following methods:

Method	% of Total
Fixed/Price/Month	_____
By Transaction	_____
Resources Used	_____
Other (specify):	
_____	_____
_____	_____
	_____
	100%

INPUT

2. What price changes have you made and are planning to make in the following areas?

Area	Percent Change (Up or Down)	
__Mode of Service__	__Past Two Years__	__By 1980__
Remote Computing (average)	_____	_____
Batch (average)	_____	_____
Total Processing (average)	_____	_____
__Type of Service__		
General Business	_____	_____
Scientific & Engineering	_____	_____
Industry Specialty	_____	_____
Utility	_____	_____

3. Please identify for the past two years and by 1980 what your increase in sales volume is and what percent is attributed to price increases.

	Past Two Years	By 1980
a) Percent of Sales Increase	_____	_____
b) Percent of Sales Increase/ Price Increase	_____	_____

INPUT

4. During the past two years was there any major restructuring of your prices?

           ____ Yes   ____ No

    Please explain: _____

    _____

    _____

    _____

5. As a result of your price increases have you lost any of your customers?

    Yes _____ % Sales Volume

    No _____

6. Did the lost business go:

    a)   In-house _____

    b)   Other Service Vendor _____

    c)   Hardware Vendor _____

    d)   Discontinued Service _____

7. Have you experienced problems with your customers in the method of billing?

    Yes _____

    No _____

INPUT

8. As a result, have you gone to a functional billing method or other method easier understood by your customers?

    Please explain: _____

    _____

    _____

    _____

9. What percent discount do you offer in the following areas, and do you expect it to increase or decrease by 1980?

Area	% Discount	Amount Expected Increase/Decrease 1980
Volume	_____	_____ _____
Long-Term Commitment	_____	_____ _____
Education Sector	_____	_____ _____
Government Sector	_____	_____ _____
Other: _____	_____	_____ _____
_____	_____	_____ _____

10. Do you foresee any new discounting practices in your company in the next two years?

    Please explain: _____

    _____

    _____

    _____

INPUT

11. Please rate the following factors (5 = high, 0 = low) in terms of increasing in-house competition:

    a)   Cheaper Hardware   _____

    b)   Cheaper Communications, e.g., VAN   _____

    c)   Greater In-House Sophistication   _____

    d)   Better Software for Hardware Vendors   _____

    e)   Better In-House Developed Software   _____

    f)   Distributed Processing   _____

    g)   Security   _____

12. Do you plan to include hardware offerings as a part of your services?

    Yes _____

    No _____

13. What percent of your revenues do you expect this will be?

    1978 _____

    1979 _____

    1980 _____

14. Do you foresee these hardware offerings as a means of protecting your service customers?

    Yes _____

    No _____

15. By what percent do you see your services business changing in the
     following areas as a result of your hardware offerings (self-impact)?

Area	Percent Change (Up or Down)
Remote Computing	_____
Batch	_____
General Business	_____
Scientific & Engineering	_____
Industry Specialty	_____
Utility	_____

16. How will these hardware offerings be financed?

     _____

     _____

     _____

17. How will these hardware offerings be maintained?

     _____

     _____

     _____

INPUT

18. For the next two years, please rate (5 = high, 0 = low) the following factors that will have an impact on your pricing policies:

   a)   Federal Government Actions _____

   b)   General Economic Conditions _____

   c)   Competition from In-House _____

   d)   Competition from Hardware Vendors (new products) _____

   e)   Competition from Service Vendors _____

19. Please rate (5 = high, 0 = low) the following factors in order of importance for your pricing policies:

   a)   Maximize Profit _____

   b)   Maximize Revenue _____

   c)   Meet Competition _____

   d)   Survive _____

20. At what level(s) in your company are price decisions made for:

   a)   Existing Products _____

   _____

   b)   New Products _____

   _____

INPUT

21. There are a number of cost elements that contribute to the price of RCS services. Please rate (5 = high, 0 = low) the following cost elements in order of importance:

a) Hardware Cost _____

b) Personnel Cost . _____

c) Communications Cost _____

d) Marketing Cost _____

e) Profit Margin _____

f) Competitor's Prices _____

g) Special Incentive Prices _____

22. Please rate (5 = high, 0 = low) the impact of the following technologies on services pricing for the next five years:

a) Microprocessors _____

b) Memory _____

c) I/O, e.g., Laser Printers, Voice Input _____

d) Firmware _____

INPUT

B.   SOFTWARE PRODUCTS

1.   What price changes have you made and are planning to make in the
      following areas?

Area	Percent Change (Up or Down)	
	Past Two Years	By 1980
General Business Products	_____	_____
Scientific & Engineering	_____	_____
Industry Specialty Products	_____	_____
Systems (e.g., DBMS) Products	_____	_____

2.   During the past two years was there any major restructuring of
      your prices?
      _____ Yes   _____ No

      Please explain: _____

      _____

      _____

      _____

3.   Please check the pricing method used for each product area:

	Fixed Price	Monthly Lease	Annual Lease	Other Specify
General Business	_____	_____	_____	_____
Scientific & Engineering	_____	_____	_____	_____
Industry Specialty	_____	_____	_____	_____
Systems	_____	_____	_____	_____

INPUT

4. What percent discount do you offer in the following areas, and do you expect it to increase or decrease by 1980?

Area	% Discount	Amount Increase/Decrease 1980
Volume	_____	_____ _____
Long-Term	_____	_____ _____
Education	_____	_____ _____
Government	_____	_____ _____
Other	_____	_____ _____

5. Please rate the following factors (5 = high, 0 = low) in terms of increasing in-house competition:

a) Greater In-House Sophistication _____

b) Better In-House Developed Software _____

c) Better Software from Hardware Vendors _____

d) Distributed Processing _____

e) Security _____

6. For the next two years, please rate (5 = high, 0 = low) the following factors that will have an impact on your pricing policies:

a) Federal Government Actions _____

b) General Economic Conditions _____

c) Competition from In-House _____

d) Competition from Hardware Vendors (new products) _____

e) Competition from Vendors _____

INPUT

7. Please rate (5 = high, 0 = low) the following factors in order of importance for your pricing policies:

    a) Maximize Profit   _____

    b) Maximize Revenue   _____

    c) Meet Competition   _____

    d) Survive   _____

8. At what level(s) in your company are price decisions made for:

    a) Existing Products _____

        _____

    b) New Products _____

        _____

9. There are a number of cost elements that contribute to the price of software products. Please rate (5 = high, 0 = low) the following cost elements in order of importance:

    a) Hardware Cost   _____

    b) Personnel Cost   _____

    c) Communications Cost   _____

    d) Marketing Cost   _____

    e) Profit Margin   _____

    f) Competitor's Prices   _____

    g) Special Incentive Prices _____

INPUT

10. Please rate (5 = high, 0 = low) the impact of the following technologies on software product pricing for the next five years:

    a)   Microprocessors   _____

    b)   Memory   _____

    c)   I/O, e.g., Laser Printers, Voice Input   _____

    d)   Firmware   _____

INPUT

APPENDIX C: DEFINITIONS

APPENDIX C: DEFINITIONS

● **COMPUTER SERVICES**

These are services provided by vendors that perform data processing functions using vendor computers or assist users to perform such functions on their own computers.

● **REMOTE COMPUTING SERVICES (RCS)**

Provision of data processing to a user by means of terminals at the user's site/s connected by a data communications network to the vendor's central computer. The three sub-modes of RCS are:

1.   INTERACTIVE (timesharing) is characterized by interaction of the user with the system, primarily for problem solving timesharing but also for data entry and transaction processing; the user is "on-line" to the program/files.

2.   REMOTE BATCH is where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

- III -

INPUT

3.   <u>DATA BASE</u> is characterized by the retrieval of information from a vendor-maintained data base. This may be owned by the vendor or a third party.

●   **BATCH SERVICES**

This includes data processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and COM processing, are also included. Batch services include those expenditures by users which take their data to a vendor site which has a terminal connected to a remote computer used for the actual processing.

●   **SOFTWARE PRODUCTS**

This category is for users' purchases of systems and applications packages for use on in-house computer systems. The figures quoted include lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' sites. Fees for work performed by organizations other than the package vendor are counted in professional services. The two sub-categories are:

I.   <u>SYSTEMS PACKAGES</u> are operating systems, utilities, and language routines that enable the computer/communications system to perform basic functions. This software is provided by the mainframe manufacturers with their hardware; other vendors provide improved versions of this and special-purpose routines. This classification includes compilers, data base management software, communications packages, simulators, performance measurement software, diagnostic software, and sorts.

- 112 -

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2.   APPLICATIONS PACKAGES are software that perform processing to serve user functions. They consist of general purpose packages, such as for accounting and inventory control, and special purpose packages, such as personal trust, airline scheduling, and demand deposit accounting.

● **PROCESSING SERVICES**

Processing services encompass FM, RCS, and batch services: they are categorized by type of service, as distinguished from mode of service, bought by users as follows:

-    GENERAL BUSINESS services are processing services for applications that are common to users across industry categories. Software is provided by the vendor; this can be a complete package, such as a payroll package, or an application "tool," such as a budgeting model, where a user provides much of the customizing of the finished product it uses. General business processing is often repetitive and transaction oriented.

-    SCIENTIFIC AND ENGINEERING services are the processing of scientific and engineering problems for users across industries. The problems usually involve the solution of mathematical equations. Processing is generally problem solving and is non-repetitive, except in the sense that the same packages or "tools" are used to address different, but similar, problems.

-    INDUSTRY SPECIALTY services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an application "tool" that the user employs to produce its unique solution. Specialty applications can be either business or scientific in orientation; data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are

- 113 -

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also included under this category. Examples of industry specialty applications are: seismic data processing, numerically-controlled machine tool software development, and demand deposit accounting.

- UTILITY services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- 114 -